

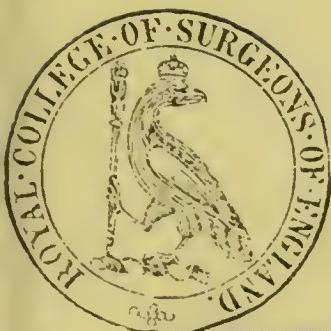
OBSERVATIONS

ON THE

PESTILENTIAL CHOLERA,

ETC. ETC.

LONDON:  
J. MOYES, CASTLE STREET, LEICESTER SQUARE.



# OBSERVATIONS ON THE PESTILENTIAL CHOLERA, (ASPHYXIA PESTILENTA),

AS IT APPEARED AT SUNDERLAND IN THE MONTHS OF NOVEMBER  
AND DECEMBER, 1831:

AND ON THE  
MEASURES TAKEN FOR ITS PREVENTION AND CURE.

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"En faire les moyens et non pas la fin de notre étude, et ainsi tâcher de les surpasser en les imitant."—PASCAL *de l'Autorité en Matière de Philosophie*, Art. I. p. 135.

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By WILLIAM AINSWORTH, Esq.

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LATE SENIOR PRESIDENT  
OF THE ROYAL PHYSICAL AND PLINIAN SOCIETIES  
OF EDINBURGH, ETC. ETC.

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LONDON:  
MESSRS. EBERS AND CO., OLD BOND STREET.

M.DCCC.XXXII.



TO

JAMES WARDROP, Esq., F.R.S., F.Z.S.

SURGEON EXTRAORDINARY TO THE KING,

ETC. ETC.

MY DEAR SIR,

As I owe to your conversation the suggestion of many of my researches on *Asphyxia pestilenta*, and more especially on the indications necessary to effect a distinction between an epidemic and an infectious disease, I feel an increased pleasure in being able to pay the tribute of a dedication to one to whom I am, in so many other respects, deeply indebted.

I remain, my dear Sir,

With respect and esteem,

Very sincerely yours,

*London,*  
*February 1832.*

W. AINSWORTH.

A faint, large watermark of a classical building with four columns and a triangular pediment is centered in the background.

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## INTRODUCTION.

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THE desire of being useful to the cause of humanity, and of contributing, as far as is in my power, to prevent the diffusion of a new and fatal malady, has alone induced me to lay these observations before the public. Other circumstances had led me some time ago to devote more than ordinary attention to the progress, character, and symptoms of the pestilential Cholera, or, more properly, *Asphyxia pestilenta*; a name given to it by Dr. Copland, and which I shall retain in this memoir. When this virulent disease made its appearance on our own shores, I was one among the many who went, full of anxiety and expectation, to challenge by observation the discordancy which obscured the opinions of medical men; and I hope, instead of being an alarmist, that the perusal of the account which I have drawn up of that

part of the town of Sunderland where the ravages of the pestilence were most evident, and of the impotence of the civil measures which were taken to prevent its propagation, will do more than mere assertion to allay anxiety, and extinguish those germs of fear which exist in the bosoms of so many. It is not a pleasant task to chronicle the errors of mankind ; but that is of little importance when the welfare of all is at stake, and when virtue preponderated so much in the very spot where ignorance and dishonesty for a time prevailed.

It would be unjust to say, that, to a certain extent, the inhabitants of Sunderland, placed in so peculiar a situation, acted differently to what the inhabitants of any other town would have done. It is a very long time since a plague, or pestilence of any kind, has visited Great Britain ; several generations have succeeded one another since then ; and security has begotten rashness, just in the same manner that the farmer at the foot of Vesuvius cultivates his land, or the villagers of Lavey, near Martigny, saw the water-courses of their valleys

become dry, and their streams accumulate behind barriers of ice, yet satisfied themselves with posting sentinels and establishing signals, to warn off the inhabitants should the flood-gates give way. The consequences it is needless to point out. The causes of this apparent recklessness are in the human mind, and they exist just as much in an individual as in a body corporate: but an individual you can pity, or excuse—he has the plea of ignorance, or the vain boast of contempt for danger. But a body elected to preside over and guard the welfare of the community, can neither be pitied nor excused, and must be held up to that chastisement of universal opinion, against which no man ever yet could stand.

It is, however, pleasant to turn from the insults offered to humanity by the mercenary few, to the sacrifices which were made by the many. In Sunderland, on every side, there was a willingness, each according to his means, to relieve the necessities of the poor; and all well-informed persons were ready to second the medical men, who them-

selves never allowed opposition or false statements to lead them one moment to deviate from their duty. Some gave spirits, some blankets, and others linen; but most contributed their mite: and the evil being done, there was nothing to prevent calm and judicious measures being opposed to the progress of the disease, except the perverseness of some who put obstacles in the way of these Christian-like and charitable proceedings, and led to that violence which at one time almost rendered it impossible for the medical men to pursue their unenviable avocations and ill-requited labours.

It has been remarked, with much justice, that the publication of many works upon one subject is generally a proof that none of them has been satisfactory. So far is this true, that at Berlin a periodical, under the title of *Cholera Gazette*, was especially devoted to the accumulation of facts; and yet, after the practical experience which the works of the continental observers, or the course of the pestilence on the banks of the Wear and the Tyne, have given us, a similar publication might, with very

great advantage, be commenced in this country.\* Such is the importance of the subject, and such the uncertainty of even the best-informed with regard to the nature of the disease ; and so slight has been the success which painful experience has obtained in its treatment and its cure.

The observations which I have introduced in this little work, on the proceedings of the different Boards of Health, are chiefly founded upon their own documents. If I have made any mistakements, I stand open to correction, and will acknowledge them when pointed out. The remarks I have offered on the infectious character of the disease, and the necessity of quarantine regulations, are the results of my unbiassed reflections on the manner in which the disease was propagated. For the symptoms of the malady, in the different stages of each period of the disorder, and the various grades which result from them, I have (excepting where the authority is quoted)

\* Since the above was written, a *Cholera Gazette* has been begun, and is published weekly.

depended upon personal observation. With regard to treatment, I had few opportunities of making therapeutical researches; and therefore chiefly contented myself with noting down the results of the remedial measures which were adopted by other persons. And, lastly, in the physiology and pathology of the disease, I had the pleasure of finding the facts which had been collected on that subject—more especially by Mr. George Hamilton Bell—to be borne out by all that I observed in the symptoms of the disease, the examination of the secretions, and the appearances upon dissection; and it certainly is, under any circumstances, more agreeable to contribute towards the establishment of sound doctrine, than to build some showy superstructure of our own, for the amusement of any master-mind that may be in quest of a plaything.

I must also take this opportunity of returning my public thanks to those who assisted me in my researches. I may particularly allude to Dr. Ogden and Mr. Torbock, who never allowed an occasion of letting me visit cases

to escape them. Mr. Torbock further granted me the full use of his surgery, to which I could direct any persons who might be in want of medical relief. Dr. Daun, with his characteristic amiability, not only furthered every plan of treatment that was suggested, but offered his influence to obtain funds, if such should be necessary. I have also to return my grateful thanks to Drs. Abbs, Hazlewood, Gibson, Brown, and Clanny; and to Messrs. Mordey, Dixon, Green, and Embleton. I am further under obligations to many, who, not being public men, I can only assure of my grateful reminiscences.

To conclude: the history of Cholera, or *Asphyxia pestilenta*, is that of a disease which, whether springing from the addition of new characters to a malady which has long afflicted a certain portion of the human race, or arising from new modifications established in the chemical relations of man and matter, presenting a malady *sui generis*, with new symptoms and new laws of propagation, has nevertheless originated under the observation of the present

generation—spread rapidly over the populous country where it first made its appearance—traversed the ocean to distant countries, to the east and to the west—crossed the arid deserts of central Asia—penetrated the rocky barrier which separates that continent from Europe—and reached its furthermost isles, without leaving in this progress a single breach which required filling up, to mark that its dissemination was not progressive and defined.

This propagation was independent of laws which belong to astronomical science; for it followed neither the same isothermal, isotheric, or isochemical lines; it followed no magnetic curve of similar variation or intensity; nor has there, during its prevalence, been any eccentricities in the motions of the heavenly bodies. It was equally independent of laws which regulate the constitution and phenomena of the atmosphere; for it travelled in all seasons, and was accompanied by no change in the chemical nature of the air: it spread with, or in opposition to, the winds, and existed during the prevalence of winds from all quarters. The

human constitution is rendered more susceptible by, but the pestilence has shewn itself independent of, all atmospherical influences, whether of humidity or of rarefaction. It extended its baneful influence from marshes to deserts, and from illventilated towns to the hut on the mountain. Its propagation has always been independent of terrestrial influence, for it existed when the gaseous exhalations could not have been the same ; on cultivated and uncultivated lands, on every variety of soil, of vegetable covering and of geognostic formation, on pasture and on forest, on sand and on rock, in cities and on the sea. But in this remarkable progress of the pestilence, from the Delta of the Ganges to the remote districts of China, the islands of Australasia, and the civilised and prosperous countries of the West, it has observed one universal law--that of following the great roads of the communication of mankind. It did not suddenly and unaccountably make its appearance at Jessore, at Timor, at Pesth, and at Sunderland ; but when there was sea there was communication, and when there was land

it marked its progress so distinctly, that the line of its course has been traced upon a map, as if the personification of a pestilence had been travelling over the different countries of Europe and Asia, leaving the mark of his finger behind him. It is quite another consideration, whether atmospherical vicissitudes, or disadvantages of geographical or local position, exercise any influence upon the spreading of the malady after it has once established itself in a place. I shall advert to this afterwards ; it is sufficient, for the present, that a brief but comprehensive sketch of the circumstances under which the malady propagated itself, wholly independent of its habits as a disease, point out the fact, that the *Asphyxia pestilenta* is essentially an infectious pestilence, whose propagation depended, in the first place, on the importation of a quality capable of generating a new disease, to which all nations seem liable, and which, from the short time the virus exists in the human body, is generally slow in spreading from one place to another.

These circumstances, contained in the his-

tory of the propagation of the disease, and supported by most satisfactory evidence on the mode of that propagation since its arrival in Europe, authorised different governments, and among others our own, to take those precautionary measures which, while they were adapted to the political state of the country and the genius of the people, seemed best calculated to ward off the attacks of this new enemy to mankind, and to prevent his reaching, or to diminish his fatality in, their different territories. It becomes a task, of which I willingly take upon myself the burden, to investigate the nature of these precautions, and, as I have had peculiar opportunities of observing their action, of pointing out how far they were carried into execution at the first arrival of the disease—at a moment when, if any thing was to be expected to save a country from the devastation of a deadly pestilence, it was unanimity in council, and energy in action; and if by this investigation we can in any one instance insure wisdom, by engrafting

it on error, and save a single town from the ravages of a disease little to be dreaded when met with caution and firmness, my object will be more than accomplished.

## OBSERVATIONS,

ETC. ETC.

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### ACCOUNT OF SUNDERLAND, AND PROCEEDINGS OF THE BOARDS OF HEALTH.

As early as the month of April, 1831, orders were issued from the Admiralty to place all ships coming from Russian ports under rigorous quarantine; and this order was subsequently extended to all vessels coming from places in the neighbourhood of towns where the Cholera was known to exist. Although, actuated by a spirit of innovation, there are some who regard quarantine laws as an antiquated usage, there can be no doubt that we were indebted, considering our great commercial intercourse with the Baltic, to the exactness with which these orders were enforced, as well as to the short time which the virus remains active, for our

lengthened immunity from the disease ; and that many towns have as yet been preserved from the malady by the excellence of our quarantine regulations. The laws of the freedom of rivers and ports, and the precautions taken for the safety both of coasting and of foreign navigation, entailed by the natural difficulties of the art, and the necessity of impeding surreptitious commerce, render any arrangements with regard to navigation more effective than even the internal police of the most despotic government. If, then, quarantine regulations have been really useful in warding off the new disease, as they have been found by the experience of ages to do with regard to other infectious disorders, it must be expected that the present malady will have shewn itself where those laws have been neglected or infringed, or where local circumstances prevented their successful adoption. To this last fact alone I attribute the breaking out of the disease in Sunderland ; and it will be easy to shew, that natural obstacles lay in the way of any effectual quarantine on the Wear, which do not exist to a similar extent in any other place admitted as fit for the performance of a rigorous quarantine. These difficulties were afterwards attempted to

be obviated, but even then with doubtful success ; and thus the disease might have a foreign origin, though not capable of being traced to a ship, yet beginning with a sailor employed on the river, and exposed with others to the immediate contact of numerous vessels coming from infected parts.

The river Wear, immediately at its confluence with the ocean, is narrow and of inconsiderable depth, and is navigable only to a short distance inland. Its navigation is preserved by various acts of parliament, the last of which dates the 29th of May, 1830. The stone piers which confine the river at its *embouchure* are flanked by a low rocky shore to the south, and sand-banks to the north, which last have not existed more than thirty years : these are succeeded, at a short distance, by cliffs of magnesian limestone, a hard buff yellow rock, sometimes uniform enough in its grain to be fit for building, at other times consisting of round masses, grouped together like cannon balls : both varieties afford a thin soil, of a very medium quality. The town of Sunderland, comprising the townships of Sunderland, Bishopwearmouth, and Panns, and Monkwearmouth and Monkwearmouth shore, is built

to the south, immediately on the rock, but to the north a thick bed of diluvium intervenes; this, however, is soon superseded by the limestone, which, approaching the bed of the river on both sides, forms high cliffs towards the upper part of the town, over which the celebrated iron bridge is thrown, adding a feature of striking beauty to this place, already so picturesque from the gradual elevation of the ground and the irregularity with which the numerous buildings appear piled together, rising confusedly one above another, to overhang the crowded shipping of the river.

Monkwearmouth and Monkwearmouth shore occupy the northern banks of the river, and are in reality the most irregular part of the town, having originated apparently in the huddling together of a few houses on the banks of the river, which gradually stretched up the hill-side to unite with some buildings of olden time, which still exist there in the sombre hue of neglect and dilapidation. Bishopwearmouth and Sunderland consist of one long and wide street, from which others diverge at right angles. In Sunderland, those to the north terminate in a narrow street parallel to the High Street, immediately on the bank of the

river ; those to the south are mostly narrow passages, crowded with the thickly-populated houses of the poor, badly paved, with a gutter in the centre, where all the filth of human habitations is heedlessly thrown, and still more carelessly left to accumulate for weeks together, open upon the town moor,\*—a large piece of pasture-land stretching to the sea-side, and which, from the tenacious nature of the substratum, is marshy in the winter months, and its roads almost impassable. The barracks flank this moor on the one side, and the parish-church and poor-house are at the other end. Bishopwearmouth has the advantage of being inhabited by the wealthier classes : it is a neat, well-built, and airy town, in which the pestilential disease scarcely ever dared to shew itself.

Much inconvenience results from this great difference between the two parishes ; for, all the wealthier persons taking up their abode in Bishopwearmouth, the poor of Sunderland are deprived even of the few resources which

\* This was the great focus of the Cholera. The day on which Magendie arrived, I had the honour of taking him to visit cases in these streets ; and his first request was, to furnish him with a bottle of the air which circulates in them, that it might be subjected to analysis !

remained for them in the contributions of the rich. Their difficulties are further increased by a system, which I believe obtains in many parish towns of Great Britain, of farming out the care of the poor to the highest bidder ; and it is a passing joke among the good people of Sunderland, that the occupant of this novel kind of lucrative situation generally retires at the expiration of a few years, a sharer in the possession of one or two stout vessels on the river.

The reader will now be able to form a pretty accurate conception of the situation and general character of the town of Sunderland. He is aware, that vessels coming from foreign parts, or infected places in our own dominions, to the crowded ports of London or Liverpool, sail at once into Stangate Creek, on entering the Thames ; or, in the Mersey, they go to an equally effective situation, as unobjectionable as the quarantine stations in the Firths of Forth or Cromarty, where ships ride with their ominous-looking yellow flags, with scarcely a chance of communicating disease. Now, in the river Wear it was impossible to keep the ships, even for a very short time, without imminent peril, outside of the pier ; and so they were obliged to go up the river, which is only a

few hundred feet in width where it divides the town, and crowded with shipping, throughout its whole course, to the village of Deptford, about a mile and a quarter beyond the bridge (whose span is 236 feet), and where they were surrounded by keels or boats, and in a situation from whence a dirty rag could have been thrown almost into the centre of a poor and filthy population. Subsequently, indeed, ships were ordered to drop their anchors at the entrance of the river, within the pier; but even this was not a situation at all favourable for any thing like a rigorous quarantine; and there is nothing in the arrival of the disease at Sunderland that at all reflects upon the commissioners of the port, or those in authority under them; as it entirely resulted from the force of circumstances, which, at the same time, explain how it should have made its appearance in that town rather than in more populous or more frequented ports.

The disease broke out, or rather seized an individual, at the latter end of October, 1831. The two Sproats, father and son, were employed as keelmen on the river. The old man died of the malady on the 26th; his son and his granddaughter took ill on the 27th. The former was

removed to the infirmary, where he died on the 31st : the female patient recovered. A nurse at the infirmary, who is stated to have had no other communication with the diseased Sproat than laying out his body, also fell a victim to the disease ; and the house-surgeon, who slightly injured himself in the examination of the nurse's body, was taken ill in the streets, but recovered. From this period to the 3d of November, there was a gradual succession of cases, amounting to six altogether. On the 3d and 4th of the same month there were no new cases ; on the 5th, there was one ; on the 6th, there were six ; and by the 10th it had attained the average number of daily cases which it has reached during its prevalence in that town.

The town of Sunderland had been one of the first in this country to form a Board of Health. At the period of the arrival of the disease the same Board was in existence that had been constituted in the month of June, consisting of the magistrates, clergy, medical men, and principal inhabitants of the town ; and at that time Mr. Robinson was the chairman of the Board, and Dr. Clanny was chairman to the medical department. A meeting was held on the 1st of November, Dr. Clanny in the chair ; and five

cases of Cholera were reported, of whom four had died in a few days, and the fifth lay at the point of death. It was immediately put from the chair, without comment, “Is it the opinion of the medical gentlemen present that the continental Cholera has made its appearance in Sunderland?” Those who were of this opinion were to hold up their hands, when it was carried unanimously. *Pro forma*, I suppose, those who were of a contrary opinion were requested to hold up their hands, when not one hand was held up. The next resolution—a very proper sequence to an opinion so unanimously held—was drawn up by Dr. Brown, and agreed to: “That the medical gentlemen under whose observation cases of Asiatic Cholera have fallen, draw up a full report of them, and place them, by the forenoon of the 2d instant, in the hands of Dr. Clanny, to be transmitted by him to the Board of Health of London.” This report arrived in London on the 4th of November, when the Privy Council immediately ordered all vessels coming from the river Wear to be put under quarantine regulations.

The mode of proceeding under the present circumstances was clearly indicated,—it was to

make every exertion possible, and to leave no plan untried, to stifle the disease in its birth-place. Supposing that the advice of the Central Board of Health, recommending the isolation of houses, could not have been put into execution, at least the patients could have been removed, or, in the case of the first few, little communication allowed. This it was the interest of the town of Sunderland to do, not less for the cause of humanity than for their commercial prosperity. I do not mean to assert, that well-regulated measures of this kind would have certainly put a stop to the inroads of the disease; but certain it is, that such measures have been found effectual, and should, when possible, always be put in practice on the first breaking out of the disease, by every enlightened board of health. Rigorous quarantine has always hitherto been found effectual in warding off the disease; and the chances of preventing its propagation are greater in proportion to the small number affected.\*

\* Dr. Russell relates the following fact, on the authority of Dr. Rehman:—The son of a villager, in the government of Pensa, who was coachman to a nobleman at fifty versts distance, died of Cholera. The father went to the place to collect the effects of his son, and brought home with him his

But, after the existence of the continental pestilence in the town of Sunderland was established, and the fact was authenticated by those who alone were capable of giving an opinion upon the subject, the Board of Health, with a most unaccountable torpor, appear to have taken no sanitary measures or precautions whatsoever, nor did they attempt to put in force that which they had themselves so often talked about, and the necessity of which they had so repeatedly urged. In the mean

clothes, which he put on, and wore a day or two after his arrival at his native village. He was shortly thereafter seized with Cholera, and died of it. Three women, who had watched him in sickness, and washed his body after death, were also seized, and died of the disease. The doctor arrived in time to see the fourth case; and, finding that it spread on that side of the village, he had the common street barricaded on the side where the disease had not reached, and interdicted all communication to the two sides of the village, even for the purpose of going to church. In that side in which the disease first broke out, upwards of one hundred cases of Cholera occurred, of whom forty-five died; but the disease did not appear on the other side of the barricade. The reports and information furnished to us by Dr. Lichtenstadt, Reiman, Becker, and Russell and Barry, contain innumerable proofs of the efficacy of segregation in individual cases, and more especially of public establishments,—as schools, prisons, or hospitals.

time, another party took advantage of this momentary inaction, and, having found some insignificant medical practitioners, whose opinions as to the nature of the disease were not well defined, they boldly converted doubts into facts — a procedure which met with such a glad reception among those who were threatened by a temporary loss from quarantine restrictions, that the party in a moment became influential enough to supersede and paralyse the efforts of the former Board of Health. Dr. Clanny had to publish the list of cases, at his own expense, in the Sunderland paper; so much was it against the interest of the new Board to have any cases reported at all; and thus, from want of unanimity and energy at the first moment, and subsequently from the unmanly opposition to truth of a wilful few, a malignant pestilence was allowed to gain a footing on our hitherto happy and healthy shores.

On the 10th of November a meeting was held (stated to have been numerously attended) to express the general feeling of dissatisfaction which was felt at the *erroneous* representations which had been made to government relative to the alleged importation of Indian Cholera;

and a resolution was passed, with only four dissentients, that the names of the medical gentlemen who agreed or acceded to the original report transmitted to the Central Board of Health, should be given to the public, and that the names of the medical gentlemen who dissented from that report should also be made public. The object of this dirty manœuvre to influence the medical men by the threat of holding them forth to their townsmen, on whom they depended for their support, and who at that moment were irritated and prejudiced by the misrepresentations of a party, is too evident to require any comment, and among a certain set they operated in the manner that had been anticipated. At a meeting held at the Exchange Buildings on Saturday evening, Nov. 12th, John Hubbard, Esq., in the chair, the following extraordinary resolutions were agreed to : —

“ 1st. That it is the decided and unqualified opinion of this meeting, founded upon the reports of the gentlemen appointed by the respective parishes to visit the houses of the inhabitants, that the town is now in a more healthy state than [it?] has usually been in [at?] the

present season of the year; and that, from the best inquiries that have been made in every quarter for information as to the nature of the disorder which has created unnecessarily so great an excitement in the public mind throughout the kingdom, the same is not the Indian Cholera, nor of foreign origin, but that the few cases of sickness and deaths which have taken place in the town within the last six weeks, have, in fact, been less in number than generally occur, and have arisen from that description of disorder hitherto known as common bowel complaints, which visit every town in the kingdom in the autumn, aggravated by want and uncleanliness.

“ 2d. That the paragraph inserted in the London newspapers, dated Newcastle-upon-Tyne, the 4th instant, wherein it is stated that the Asiatic or continental Cholera had been introduced into this town, by shipping, from Hamburgh, is a most wicked and malicious falsehood; and so far from such having been the case, it is the implicit belief of this meeting that no seaman or custom-house officer belonging [to?] the port has been attacked by any complaint resembling it.

“ 3d. That the measures adopted by his

Majesty's government, in requiring the shipping sailing from Sunderland to perform quarantine, and more especially in preventing (as has occurred this day), by a ship of war, all ships and other craft from leaving or entering the port, is perfectly unnecessary and uncalled for, and more especially when it is considered that the transit of goods and merchandise of every description, and unlimited communication by coaches and other means by land, is permitted to every other part of the kingdom.

" 4th. That the harshness and inconsistency of these measures are rendered more apparent by the fact that, during the raging of the Cholera on the continent, ships were permitted to bring from thence goods of all sorts, when, at this moment, ships conveying coals (a mineral) are prevented from proceeding by his Majesty's vessels of war.

" 5th. That this meeting deeply regrets that any individual, although actuated by proper and honest motives, should have given information to his Majesty's government of the existence of Indian Cholera in Sunderland, without having first clearly ascertained the fact, and without the knowledge and sanction of the principal inhabitants; and hope that the opi-

nion of this meeting, respectfully expressed, will prevent, in future, a conduct calculated to produce such disastrous consequences, not only to this town, but to the country at large.

“ 6th. That a copy of these resolutions be signed by the chairman, and forwarded to his Majesty’s government through the medium of the commissioners now here, and that the same be printed and circulated.

(Signed) “ JOHN HUBBARD, Chairman.”

Those medical gentlemen (with one or two exceptions) who apparently differed in opinion from what this meeting was anxious to establish, absented themselves on the occasion; and the following are the opinions of those present, as reported in a second edition of the *Sunderland Herald*.

“ Mr. DIXON.—That the continental Cholera has not been imported into Sunderland, and that the cases of sickness which have taken place in Sunderland are aggravated English Cholera.

“ Mr. SMITHSON.—That the Asiatic Cholera has not taken place in Sunderland.

“ Dr. BROWN.—That the cases of Cholera

which have occurred in Sunderland arise from the product of our own soil, and entirely amongst ourselves, and [that the disease?] has not been imported, and is not contagious.

“ Mr. CROUDACE. — Concurs with Dr. Brown.

“ Mr. WATSON. — That English Cholera only has prevailed here; and that he has set his face, from the first, against the proceedings of the Medical Board.

“ Mr. WHITE. — That he has not seen a case of Asiatic Cholera in Sunderland.

“ Mr. GREEN. — That the Cholera which has appeared in Sunderland has had no foreign origin.

“ Mr. FERGUSON. — That he dissented from the Report forwarded to government by the Medical Board of this town; and he does not think that we have any Asiatic Cholera in this town; and that he believes we are now in a more healthy state, with the exception of an English epidemic Cholera, than we are generally in at this season of the year.

“ Mr. GREGORY. — That he has dissented from the proceedings of the Medical Board of this town from their first commencement, and that we have no disease in this town which he

considers Asiatic Cholera, or any contagious Cholera whatever.

“ Mr. TORBOCK.—That a Cholera has appeared in the town, of a malignant character, such as has never been known in this town before, either as it regards the symptoms during the progress of the disease, or the examination after death ; but [it is ?] not of a contagious or infectious character.

“ Mr. WARD.—That his unqualified opinion is, that the disease in Sunderland is not a contagious disease, and not more aggravated than the epidemics of the four previous autumns.

“ Mr. MORDEY.—That the disease in the town is not contagious ; and that one person who died of it having had, to his knowledge, a number of individuals constantly in the room who never took it, shews that it was not contagious or infectious. To call it Asiatic Cholera is a farce.

“ Mr. COOK.—That there is no infectious disease in Sunderland, but a serious disease.

“ Mr. CANDLISH.—That the disease is not contagious, but has arisen spontaneously.

“ Mr. PENMAN.—That the Cholera which is now in the town has the same symptoms as

that which has appeared in foreign countries, and is infectious.

“**Mr. GRECIAN.**—That we have never had one case of Asiatic, foreign, or contagious Cholera of any kind.”

It is difficult in any way to reconcile the opinions given at this meeting with the unanimous conviction expressed a short time previously on the existence of the pestilential Cholera in the town; and it will appear strange that men of spirit, with their reputation for medical knowledge and for observation, if not their character for veracity, at stake, did not give themselves, if misrepresented, the trouble of contradicting any false statements that might be made on the opinions expressed or entertained with regard to the existence or non-existence of the pestilence—whether it was infectious or not, being a matter quite of secondary consideration. Certain it is, that all the medical men whom I had an opportunity of conversing with, or of visiting in their company well-marked cases of Asiatic Cholera, asserted, upon being questioned on this point, that their opinions had been incorrectly given to the world; and indeed many of them ex-

pressed such utter disgust at the manner in which they were forced to make a statement contrary to the dictates of their own judgment, that they never afterwards attended any public meetings. Mr. Dixon's opinion has, at least, the merit of consistency; for I believe he still considers the malady as an aggravated form of English Cholera. Dr. Brown's opinion was consistent with the little that was then known of the disease. Mr. Torbock's statement is fair and candid; and he, as well as Mr. Penman, one of the most intellectual young practitioners of Sunderland, must now feel all the gratification of having given opinions that consulted neither the interests of prejudice or of party. But a number of the influential medical men of the town were not present at this meeting; and conscious how little weight in the town itself, where persons were *individually* known, the sentiments of a portion of those whose opinions I have just recapitulated could ever obtain, another motion was made and agreed to, the same day, viz. :—

“ That a general meeting of the medical profession in this town be held at the Infirmary to-morrow, at noon, to draw up and agree upon

a report of their opinions of the state of health of this town, which may tend to remove the quarantine regulations which have been imposed upon it ; and that such report be delivered to the chairman, to be transmitted to government.”

The meeting accordingly did take place, when a kind of compromise was made between truth and prejudice, by obtaining the signatures of most of the medical men of the town to the following resolution, which has no meaning in it ; but which at least satisfied the party that there were some who would not subscribe their names to paltry and barefaced falsehoods.

“ Resolved, — That a disease possessing every symptom of epidemic Cholera is now existing in this town ; that it has never appeared on board of ship ; that there is not the slightest ground for imagining that it has been imported, nor that it has extended itself by contagion, though the sufferers have been attended by numbers of friends and neighbours.

“ That it appears to have arisen from atmospherical distemperature, acting in most cases upon persons weakened by want of wholesome

food and clothing, by bad air, intemperance, or previous disease; and that the interruption of the commerce of the port seems to offer the most probable means of extending the disease, by depriving the industrious poor of their bread, and thus placing their families in the depths of misery and distress.

"In conclusion, the medical gentlemen trust that the above statements will remove many misconstructions and false reports which have arisen out of this unpleasant affair, and beg to congratulate their fellow-townsman on the otherwise good health of the town."

This document was signed by Drs. Burn, Clanny, Collingwood, Miller, Hazlewood, Atkinson, Ogden, and other medical gentlemen who were not present at the meeting held the day before.

Colonel Creagh and Dr. Daun had been despatched by government almost immediately after correct information of the breaking out of the disease had been obtained; and they were, shortly after their arrival, joined by Dr. Gibson from Edinburgh. Colonel Creagh, who arrived on the 6th of November, after making himself acquainted with the facts relating to the existence

and propagation of the Cholera, employed himself in providing hospitals for the sick ; and in a report subsequently transmitted to the clerk of the Council, he sent information that orders had been issued for the barrack-master to furnish all necessary supplies of bedding and other barrack-stores ; and recommended that, should the houses then preparing not be sufficient to accommodate the sick, the barracks be converted into an hospital.

Previous to the arrival of Dr. Daun, the town had been divided into twelve districts, and four visitors were appointed to each—their duty being at first to visit every lane in the parish each day ; but this was afterwards changed to twice a-week. The first report of the visitors dates the 10th of November, and is the report alluded to in the motion at the meeting of the 12th. It is couched in the following terms :—

“ The Select Vestry for the parish of Sunderland, assembled at a meeting this evening, deem it a duty they owe to the public, in the present excited state of public feeling, to declare that in their opinion, founded upon the reports of the forty-eight gentlemen who

have twice visited every house in this parish within the last three days, that the town of Sunderland is now in a more healthy state than has been usual in the autumnal season ; and that the information which appears to have been given to his Majesty's most honourable Privy Council, that the Indian Cholera exists in this town, is not justified by the general health of the inhabitants.

“ ROBERT DIXON, Chairman.”

This is a document marked by the most extreme perverseness that ever blinded an individual, and that can hardly be supposed to have influenced a number of persons; for how the *general* health of the inhabitants did not justify the information given to his Majesty's Privy Council of the existence of five cases of a malignant disease, we must certainly be at a loss to understand.

One of the first objects with Dr. Daun, on his arrival, was to enforce cleanliness, and, as far as was in his power, to recommend the immediate adoption of all those measures which might be supposed to influence the spreading of the disease. As early as on the 3d, a notice had been published, recommend-

ing cleanliness, and advising every poor family to whitewash their rooms; and to enable them to do so, a quantity of quicklime was laid at several depôts, so that poor families might be supplied gratis. Few, however, took advantage of these prophylactic means. On the 7th, a second notice appeared, bearing the signatures of two of the magistrates:—“ That on the best consideration, and aided by the opinion of Dr. Daun, we think it right to impress on the inhabitants in general, and more particularly upon those residing in narrow streets and lanes, the necessity of continuing to attend to the observance of the greatest cleanliness. We also strongly recommend that every case of sickness be reported, without delay, to the medical gentlemen of each district; so that immediate relief may be obtained, which, in Dr. Daun’s opinion, is of the utmost consequence for their recovery.”

On the 7th, the gates of the barracks were closed, in order to prohibit the garrison from having any communication with the inhabitants.

On the 9th, the fire-engines were employed in washing the narrow streets and lanes of their accumulated impurities; but only once during my stay in Sunderland did I see a

party of decrepit old men, such as are met with in the streets of Paris (veterans of the old *régime*), shouldering their besoms with a good intention, but without any beneficial results.

The gentlemen appointed to visit the different parishes reported upon the extreme poverty which they had witnessed, and the great destitution of food and clothing in which some families existed; and it was resolved that a subscription should be raised for their immediate relief, "with a special view to the cure and prevention of those maladies which extreme poverty usually generates." A public meeting was accordingly held, and a numerous and respectable committee was appointed to manage the subscription, which was in all respects worthy of a philanthropic and benevolent population, if not proportionate to the exigences of the circumstances under which the demand was made. I cannot, however, in this place avoid some observations upon the great caution which experience has taught me is necessary to be used in the distribution of blankets, flannels, or wearing apparel. A large sum of money was expended in this way at Newcastle, before the disease had existed there hardly a week, and the same thing occurred in Sunder-

land, when the fund was so exhausted that a much more important object, the Cholera hospital, was supported for a short time by the donations of medical strangers, and afterwards by government. It would be well, also, if blankets are to be given, that, in the impossibility of distributing them to all, some should be left for the urgent demands of the disease. I have myself been witness of a case in which three children were afflicted, and there was not a blanket in the house to wrap them up in. It is likewise well known, that in populous towns such articles are frequently disposed of for drink or food, on which account some parishes have recourse to the system of lettering them, and of issuing a warning to pawnbrokers and others.

It might have been thought, that, these preliminary measures having now been accomplished, and the presence of Colonel Creagh and of Drs. Daun and Gibson having induced a momentary silence from the opposition party, which had more particularly begun to feel the absurdity of its own acts, nothing would now have lain in the way of a fair investigation of the progress and the treatment of the pestilential disease. Unfortunately, this, however,

was not the case; and a new difficulty arose, from the obstinacy of some medical men, who still persevered in asserting, that though there were some cases of disease well marked, there were others of a dubious character; and as these sometimes bore the symptoms of common English Cholera, or even of simple diarrhoea, they persisted in considering them as such; and consequently, in many cases, when a new and infectious disease was, to their own knowledge, propagating itself in a populous part of the town, instead of exerting themselves to obtain the removal of the patients to the hospital, they were contented with adopting a treatment applicable to common autumnal Cholera, though with what success I do not know. This system of evasion was most vexatious to the gentlemen appointed to report upon the progress of the disease, more especially as they might probably have seen some of the cases sent in as common Cholera, and recognised them to be modified forms of the *Asphyxia pestilenta*, and their feelings as medical men were revolted at having now and then a death sent in as diarrhoea, or several in a day of autumnal Cholera, in the month of November! The Medical Commission got a cir-

cular signed by three magistrates, to be distributed among the practitioners of the town, and, enclosing printed forms of returns, requested them to be filled up with the cases of Cholera, of whatever description and character, which might come daily under their notice : but this not sufficing, it was finally arranged that all cases of diarrhoea and of common Cholera should be included, as the Commission were well aware that diseases of that character could not exist to any amount at this period of the year ; and they might thus be enabled to obtain some approximation to the real extent of the evil.

Soon after Dr. Barry's arrival in Sunderland, a new Board of Health was constituted. Mr. Robinson was again the chairman, and Drs. Daun, Gibson, and Clanny, were members ; and one of their first acts was to institute a kind of inspectorship over the fraudulent system of reporting. The order dates the 28th of November, 1831, and contains the following resolutions : —

“ 1st, That it is the duty of every medical practitioner, when called to a pauper patient labouring under Cholera, to use his best

endeavours to persuade his patient to consent to be removed to the Cholera Hospital without delay; and in the event of such patient refusing to comply with that advice, it shall then be the duty of the medical attendant to give immediate notice to the nearest of the under-mentioned medical inspectors, who have been appointed by the Board, viz. Dr. Miller, Dr. Hazlewood, Dr. Ogden, and Mr. Torbock, and who shall, with all convenient speed, visit the said patient; and should he see fit, he shall urge the instant removal of the patient, and if that cannot be done, to report on such case to the Board.

“ 2d, That the medical inspectors be empowered to call on any medical practitioner for a daily state of his Cholera patients, not coming under the denomination of paupers, should either such patients or their medical attendant refuse to allow the medical inspectors to see them.

“ 3d, That all medical practitioners and inspectors be required to comply strictly with the foregoing resolutions and directions; and that in case of any omission or neglect in carrying the same into full effect, immediate information thereof be given to this Board,

in order that a report thereon may be transmitted to government.

“ 4th, That the Board do state, in proof of the superior advantage of early hospital treatment, that out of a family of five persons attacked with Cholera, the only individuals who recovered were the two conveyed to, and attended at, the hospital.

“ *Memorandum.*—That the Privy Council have ordered that in future no examination, after death, of persons conveyed to the hospital shall take place.

“ 5th, That the secretary be requested to transmit a copy of the foregoing resolutions and order to each medical gentleman, and that copies be generally circulated in these towns.

“ By order of the Board,

“ GEO. STEPHENSON, Secretary.”

The fourth resolution alludes to the family of the Nicolson's, of which the only two that survived had been under treatment at the hospital ; and the memorandum appended to the resolutions more particularly alludes to an examination which took place in the hospital, and which, having been accidentally made public, was taken advantage of, in the

excited state of the public mind, to create a prejudice against the hospital. Indeed, it operated so powerfully at one time, that no one would go there, even when urged by the most powerful representations. The system of inspectorship never worked well; and such was the opposition the gentlemen appointed met in the performance of their duty, that a day or two afterwards they were forced virtually to resign their office. They were not only publicly lampooned, but were also privately insulted; and yet the offenders were never brought to any account.

In consequence of the attention of the public having been more particularly called to the possibility of the infectious properties of the disease continuing after death, and some circumstances contributing strongly at that time to corroborate the fact, to which we shall allude in another part of this memoir, it was ordered by the magistracy of the town, in a notice bearing date 9th December, 1831, "That all persons dying of Cholera be buried within twelve hours after their decease, at latest; and that their graves be dug not less than of the depth of six feet, if possible, and in ground to be set apart and appropriated for that purpose only."

In consistency with the quarantine measures adopted by England towards the ports of Europe, as well as by the latter towards England, and in consideration of the contiguity and constant intercourse subsisting between the principal towns on the Wear and Tyne, the shipping of both these rivers had been placed under the same quarantine restrictions ; a measure so much the more necessary, as its non-enforcement might have entailed a quarantine against the whole country ; and, for a short time, it was found necessary to send one of his Majesty's sloops to cruise off the Wear, for the better preservation of these regulations. This system of surveillance was, however, soon discontinued ; and when the disease made its appearance at Newcastle and other towns, a measure productive of much more inconvenience was done away with ; and instructions were given from the Council Office, bearing date December 8, to the officers of customs at Newcastle, North and South Shields, Sunderland, and Seaham, not to interrupt in future the communications between those places, by putting vessels from any of them in quarantine.

Such, then, is a brief account of the manner in which the pestilential Cholera made its

appearance and was disseminated in the town of Sunderland, and of the measures which were taken to prevent its propagation. It will, I am sure, be a lesson to other towns similarly circumstanced; for it requires no lengthened argument to shew how truly blind the influential part of the inhabitants were to their own interests, in entering upon the proceedings which I have recapitulated at a crisis of such importance. They disputed among themselves, they memorialised government, they denied the existence of the disease, and misrepresented the medical authorities, to obtain an end which there was at once a humane, an honourable, and an effective mode of procuring, in uniting their efforts to eradicate and destroy the disease. If the pestilence which had traversed Asia and Europe, and which, whether infectious or not, when it attacks a town or populous place, spreads rapidly, continuing its ravages for a period of time more or less definite, had not made its appearance in Sunderland, could there have been the least fear, one doubt, in the mind of any person, whether commercial or professional, but that a disease which had only carried away three or four persons at the time the paltry opposition was raised against the knowledge

of the truth, would have been immediately arrested, and the restrictions entailed by the hasty reports transmitted to the Privy Council also have been as immediately withdrawn? But if the opinions of the medical men were correct—which they were most likely to be, considering that those who announced the existence of the disease had seen the Indian type of the malady before, and those who denied it knew nothing at all about it—might they not have directed their energies with more effect in concentrating the disease, and preventing its dissemination, than in piling up their daring doubts upon an irrational and schoolboy-like denial of the fact? It is a mere absurdity to talk about the cruelty of removing patients from their homes, even against their will—tearing them, as it were, from their beds, to convey them to an hospital. I allow that it is painful to pursue such measures; but there can be no hesitation, if we consider the hundreds we may save by this single compulsory action; and though it may not always be of so much importance when the disease has established itself in a place, certainly when it makes its first appearance it is indicated as a proceeding of the highest importance to the welfare of the

community. Whether the Cholera is considered infectious or not, the same measures ought to be pursued on the first arrival of the disease. Like the pollen of plants, which loses its activity when conveyed to a certain distance by the atmosphere, so certain disorders, as the yellow fever, may go in vessels to distant climes; and though the crews have not been affected by the disease, yet will they communicate it to persons newly exposed, and will infest whole towns, when other circumstances are favourable to propagation.

The germs of an epidemic radiate as if from a common centre, and they will diminish in intensity as they become diffused. The germs of an infectious disease travel with their victim, and are regenerated by the very morbid action which they themselves excite. An epidemic propagates itself almost immediately over a populous city—an infectious disease only in proportion to the number of points over which its germs are disseminated: in the one, the first cases are the most fatal—in the other, the disease is most fatal when it has reached its acmé: in the one, it remains longest where the streets are narrow, and the air pent up and confined—in the other, it remains longest where

there is poverty, drunkenness, or debility, to predispose to its attacks. In both, there can be no doubt but that the precautionary measures, on the first arrival of the disease, should be, the sequestration of the afflicted from the healthy, and their removal to a hospital or a well-ventilated and commodious situation ; and this should continue to be put in force as long as circumstances and the spread of the disease will allow it.

ON THE NATURE AND CHARACTERS OF  
THE DISEASE.

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I. SYMPTOMS.

*Asphyxia pestilenta*, when it shews itself in its greatest simplicity, is a disorder which, by the sudden and total prostration of the vital powers, either destroys life, or induces an altered condition of the vital functions, leading to a more or less lengthened disease, according to the violence of the symptoms, or the influence of other causes. The peculiar expression in the countenance on the approach of a severe malady, or internal feelings of depression and listlessness, may exist previous to this sudden failure of vitality; or the disease may be preceded by diarrhoea or vomiting; or the two may make their appearance conjointly, accompanied with, or followed by, those symptoms of venous remora and disturbed respiration which are peculiarly characteristic of the disease, and have given to it its present name.

With regard to the diarrhoea, it may be either a predisposition to, or a mild form of the disease itself; and I have observed it preceded by that symptom for two or three days, where there was reason to suspect (as indicated by other writers) that the person was infected by the poison of the pestilence. The only circumstance that did not coincide with this view of the subject, was the suddenness with which the more marked symptoms of the malady made their appearance even in a person afflicted with diarrhoea, and the fact that, under these circumstances, the evacuations were of the ordinary kind; and this can only be accounted for by the absence of those causes which produce a change in the chemical characters of the blood and in the nature of the alvine discharges; and it is a curious fact that, in the *Asphyxia pestilenta*, all the symptoms are, to use an expression of Dr. Wilson Philip, the necessary consequences of any cause capable of making the peculiar impression on the system, which its cause, of whatever nature it may be, evidently does.

Sometimes the first symptom of the attack has been a prodigious evacuation, when the whole intestines seem to be emptied at once;

sometimes the vomiting, like the purging, occurs alone, and is afterwards followed by slight purging ; but these cases are rare. When the vomiting and purging occur pretty nearly at the same time, there is an almost immediate emptying out of the whole alimentary canal ; and after their contents are evacuated, the fluid peculiar to the disease is dejected of similar consistency and appearance from the stomach as from the intestines.

Unless the patient is awoke from sleep by an urgent call to the stool, which will be followed by a degree of weakness proportionate to the extent of the cause, these symptoms are generally preceded by giddiness, ringing in the ears, uneasiness, amounting sometimes to great anxiety or feelings of horror, and by an equal prostration of strength. The bowels begin to rumble, and fall back, as it were, upon the posterior and inferior part of the abdominal cavity, producing a sensation so marked, that, in a more advanced stage of the disorder, patients have expressed themselves doubtful whether they passed their alvine discharges in a natural manner. If the attack occurs in the day, the patient sits down affrighted at his own situation ; or if in bed, awakes, and lies

for a moment astonished at the novelty of his feelings : there is a new influence that appears to pervade the whole of his body, a sensation as if of fluttering on the pit of his stomach, and a sense of weight or constriction round the waist. This is followed by a prickly sensation in the arms and legs, extending sometimes to the fingers and toes ; the hands and feet become cold, and bedewed with a copious clammy moisture ; the pulse is generally oppressed and slow, (Mr. G. H. Bell says quick and weak) ; and there is often a pain in the forehead.

The moment the patient moves when seized by these symptoms, he is either sick or purged. This lasts from half an hour to an hour, in pretty rapid succession ; but sometimes continues at intervals till nearly the termination of the second period of the disease. After the first evacuation, cramps generally supervene, beginning at the toes, and extending up the limbs—sometimes not beyond the knee, at other times embracing the whole muscular covering of the abdomen and trunk. The face becomes of a deadly pale hue, and is expressive of great internal anxiety ; the pain becomes more intolerable in the region of the stomach ; the hands begin to shrink ; the skin

is cold, damp, and sodden—of an earthy feel ; the eye is sunk, and surrounded by a dark ring or areola. In muscular patients there is restlessness and jactitation, or tossing about in the bed. In children, there is often little or no cramp ; in them the face becomes puffy and of a leaden hue. At eighteen or twenty years of age, this is often of a deep blue tint ; but in aged persons the lips alone are generally very blue and full, the cheeks being pale and collapsed. The eye is soon turned upwards ; the patient speaks in a low tone of voice, a word or two at a time, or whispers a sentence with exertion ; the tongue is cold, and always moist and flabby ; thirst insatiable ; pulse imperceptible at the wrist and arm ; the breathing is more difficult ; the expired air is cold, and issues in a tiny blast ; sometimes there is a low whining moan ; the rhythm of the heart is partial.\* In old persons there is constantly

\* Respiration in the first stages is always hurried and oppressed ; in the second period it is slow, unfrequent, and rare : in both it is short, irregular, and laboured. In cases where the collapse is great, there is an almost total cessation of the respiratory noise.

The beating of the heart could always be heard between the fifth and seventh ribs, but was often entirely lost towards

starting of the muscular tendons ; the alæ nasi are shrunk ; the eyes are covered with a film ; there is great fetor from the body ; the integuments of the abdomen are violently drawn in ; sometimes there is slight trismus. The patient makes an effort to rise, falls down, and expires ; or, at other times, shews an inclination to sleep, or to be left alone and die. There is apparent torpor or coma, from which patients are roused by pains or by cramps. Under these circumstances they are often seen to clasp their hands in prayer, exhibiting great perfection of the intellectual powers when many of the more prominent characteristics of life are already gone. Throughout there is total suppression of urine, and of the lachrymal, salivary, and biliary secretions.

When the patient recovers from the second period of the disease, he is liable to a relapse, which is generally fatal ; or, instead of convalescing with a moderate degree of reaction

the basis of the sternum. The rhythm of the heart was in these cases imperfect, the contractions on the right side being rarer than in the natural condition ; and this was often accompanied by a singular phenomenon in the pulse, which communicated the feeling of two consecutive pulsations occurring together at irregular intervals.

according to the diathesis, an inflammatory action of a protracted kind, and oftentimes of a malignant type, establishes itself in different organs or systems of organs. The lungs are very often the seat of the disease: the convalescence is then very protracted; there is very considerable irritation, with pain in the chest, cough, and fever. Dr. Keir has very ably pointed out three other forms of the consecutive symptoms, which consist in an inflammatory or sub-inflammatory state of the stomach and bowels, or of both; in a bilious or bilio-nervous fever, with suppuration of the parotid glands; and in a congestive, sub-inflammatory state of the brain and spinal cord. This latter determination of the disease is decidedly the most fatal. There is a malignant form of fever which often terminates the disease, and which can with difficulty be connected with any of the above types: it appears to be a congestive fever, of a typhoid form, in which the tongue becomes more loaded, is redder at the tip and edges, and also dryer; there is headache; the urine is highly coloured; there is soreness upon pressure on the liver, stomach, and belly; respiration is still oppressed; a dull flush on the countenance; eyes suffused and drowsy; dark

sordes on the gums and lips; the patient is pale, squalid, and powerless; the pulse is low and languid; and these symptoms often terminate in delirium and death.

When the disease is going to terminate favourably, a gentle perspiration takes place; the external heat returns almost imperceptibly; urine is discharged; the stools become less frequent, and contain very vitiated bile; the patient gets a little sleep; the febrile action is moderate; and the convalescence short. The period of the convalescence from the different forms of the consecutive fever varies with the treatment under which the patient may have been placed. Without an active and careful treatment, there is as little chance of recovery in the consecutive maladies as in the most marked stage of the *Asphyxia pestilenta*.

There are some symptoms which accompany this pestilence, mentioned by other authors, which I had not myself an opportunity of observing: such are, the dimness of vision, and the appearance of *muscæ volitantes*, spoken of by Dr. Lefevre. The same author alludes to a tremulous motion of one or two fingers, or the fleshy part between the thumb and fore-finger;

slight spasms in the chest; pain in the region of the kidneys; and twitching of the zygomatic muscles of the face, as precursory symptoms. The last of these symptoms preceded an attack of which I was myself the subject; but I did not remark it in any one else. Some authors mention the occurrence of convulsions to such an extent as to be followed by *emprosthotonus*, when the body is contracted into a kind of ball, which it is impossible to roll out after death. This appears to have occurred during the severe inroad of the disease at Gateshead, on the 26th and 27th of December, 1831. Drs. Russell and Barry mention hiccup in the moments between the threatening of death and the beginning of reaction, as a favourable sign. I have seen hiccup accompany the disease throughout the first and second period, when it was not a favourable sign; but I had not an opportunity of observing it at the period alluded to by Drs. Russell and Barry.

From the above details it will be at once perceived that the symptoms of this new and malignant malady are uniform and characteristic, and their succession definite and well marked; and from these facts we can obtain data for considering the disease in its different

periods—for marking out the stages of these periods—and, by the termination, ascertain the different grades through which the malady may run. The term “grade” or “gradation” would mark the order or succession of symptoms as well as the term “period;” but in this case it may be well to distinguish the different periods of the disease as marked by three stages, (one of which will be typical,) from the grades of the disease as marked by the possibility of a happy or a fatal termination. Drs. Keir, Armstrong, and Ayre, have admitted a division of three periods: 1st, that of oppression; 2d, that of reaction; 3d, that of collapse. But the third period, Dr. Keir remarked, might frequently take place without the intervention of the second period. Drs. Russell and Barry adopt a division of three stages: 1st, the preliminary symptoms; 2d, the collapse, or cold stage; 3d, the fever, or hot stage. This last corresponds with all that I have had occasion to observe; for, though the first period may be followed by a moderate febrile action, terminating in a short convalescence; yet the disease, unless the patient is carried off by the first attack, never terminates fatally without going into the second period, which, if again followed by

febrile action, will pass into the three well-marked forms before alluded to, and which never precede the period of collapse. Indeed, it was in consequence of this fact that Mr. Searle divided the first period into three stages: 1st, characterised by giddiness, &c.; 2d, febrile action; and, 3d, collapse. Dr. Copland takes another view of the subject, and distinguishes the disease by the different modes of its appearance, which he calls grades, on account of their comparative severity. The first grade is characterised by marked premonitory symptoms, particularly diarrhoea, &c.; the second commences with giddiness, faintness, &c., rapidly followed by the characteristic features of the disease; and the third is, when the seizure is sudden and intense. The first two are characterised by three stages: one of depression, another of febrile action, the third exhaustion and disorganisation; the third grade more frequently rapidly terminating in death. This division is founded, however, on a mistaken notion of the disease; for the different forms of seizure are not so well characterised as represented by Dr. Copland, and depend on circumstances which I shall explain at length when noticing the pathology of the disease.

The very fact of the two first grades going through the same stages should have pointed out that there was rather a distinction made than any difference existing; and Dr. Copland has been unwittingly the means of promulgating the error of Dr. Keir, in placing the stage of reaction before that of collapse, which consequently he has supposed to be accompanied by disorganisation; whereas it is one of the peculiar characters of this disease, that, from the suddenness of death in its second period, there having been no time for reaction or inflammatory action, there is not the slightest disorganisation in the minutest and most frail structures of the human body. I have endeavoured to rally these opinions, and place them before the reader in a tabular form, as follows:—

*Types of the Periods and different Stages of the Asphyxia pestilenta.*

<i>1st Period.</i> <b>OPPRESSION.</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;">           Prostration; sometimes            preliminary diarrhoea.            Evacuations; cold sur-            face; loss of colour.            Febrile action.         </td><td style="width: 50%; vertical-align: top; padding-left: 20px;">           Termination in            death, or            cure without            convalescence.            Termination in a short            convalescence.         </td></tr> </table>	Prostration; sometimes preliminary diarrhoea. Evacuations; cold sur- face; loss of colour. Febrile action.	Termination in death, or cure without convalescence. Termination in a short convalescence.
Prostration; sometimes preliminary diarrhoea. Evacuations; cold sur- face; loss of colour. Febrile action.	Termination in death, or cure without convalescence. Termination in a short convalescence.		

<i>2d Period.</i> <b>COLLAPSE.</b>	{ Epigastric pains ; evacuations ; cramps. Secretions absent ; breath cold ; sensation dull ; eyes upturned. Animal heat ; the pulse and voice deficient. Coma.	Terminating in death.
<i>3d Period.</i> <b>FEBRILE ACTION.</b>	{ Mild. Terminating in a short convalescence. Severe. { Terminating in a protracted convalescence, in local congestive inflammations, or in death.	

The grades which result from these forms of the disease are five in number :

1. Prostration and evacuation, terminating in death.
2. The same, succeeded by a mild febrile action, inducing a rapid recovery.
3. The stage of collapse, always terminating in death.
4. A mild febrile action, terminating favourably.
5. A severe febrile action, terminating variously.

We thus find, that in the early period of the disease the symptoms are few, and the results more decided ; and in its more advanced stage the symptoms are more numerous, and the terminations more varied.

## II. MODE OF PROPAGATION.

In order that I may not be misunderstood, from the indiscriminate use of terms, I shall premise my remarks on the manner in which the *Asphyxia pestilenta* is propagated, by giving a definite acceptation to those which are in general use.

- 1st. Endemic diseases. Disorders which are peculiar to the inhabitants of particular countries.
- 2d. Epidemic diseases. Disorders which prevail at particular seasons, and spread among the inhabitants of a country.
- 3d. Contagious diseases. Disorders which are communicated by direct contact or by inoculation.
- 4th. Infectious diseases. Disorders which are communicated through the medium of any thing that has been in contact with the diseased person; as air, fluid, wearing apparel, bed-clothing, &c.

I am aware that many authors make use of the term "contagion" in a much more extended sense; but I am strongly inclined to believe

that as much benefit will be derived to science, as facilities will be given to argument, by a more limited definition. If we consider contagion and infection to be distinguishable as above, they will correspond to the mediate and immediate contagion of the French authors.

The arguments for the pestilential nature of a malady are all positive: if contagious, they are direct and evident; if infectious, they are remote and more difficultly attainable. The arguments against the pestilential character of a disease are negative, and, when opposed to the contagious properties, must be overthrown by any *single* well-marked case of the communicability of the disease by touch or inoculation; but when brought in evidence against the infectious properties of a disease, they require not only the demonstrated existence of the fact of infection, but the proof that the character and progress of the disease are connected with the operation of no other cause whatsoever, and that in no case did the disease make its appearance at two opposite points of a town or country, when there was no communication; or that, on its breaking out in any collection of human habitations, its appearance was not simultaneous in several.

Contagion and infection are terms expressive merely of certain phenomena of disease, which can only be known by their effects, and are not cognisable to the senses. There are some who will not admit of the evidence of contagion unless they can see it, like Dejanira's gift, wrapping its victims. Minds so constituted must always remain in doubt. I can only address myself to those who will allow judgment its real importance in the philosophy of the mind ;\* pointing out the facts, analysing the coincidences according to La Place's admirable theory of probabilities ; and always bearing in mind a principle admitted by Euclid, that there

\* Judgment is the analysis of the relation between cause and effect,—a balancing of motives, or of things, as it regards the inward man or the external world. All things that are not cognisable to the senses become known to us by their effects ; therefore, judgment is a mode of observation. Bacon, Locke, and Condillac, meant by observation, the employment of the faculties with which nature has endowed us, to study the object with which we wish to become acquainted ; and in this sense judgment is also as much a faculty of observation as perception. The philosophers of the modern French school say, that the method of observation is given to us by the spirit of the time, which is in itself the work of the spirit of the world. I suspect the determination is meant here, and not the method.

is no greater evidence of the certainty and truth of any proposition, than to demonstrate the contrary to be both absurd and contradictory.

Endemic diseases, I have stated, are those that affect the inhabitants of particular districts ; such are elephantiasis in Malabar, goître among the Alps, plica in Poland, pelagra in Lombardy, cretinism in the Valais, and malaria in the Campagna di Roma. The *Asphyxia pestilenta* is not an endemic disease ; for it has traversed many countries, and has affected numerous tribes of men and nations totally opposed to one another in constitution, in habits, and in customs. It must be, then, either an epidemic or a pestilential disease. If an epidemic, it may have originated in three different ways,— 1st, by importation ; 2dly, by the place where it made its appearance being situated in the sphere of the malignant action ; and 3dly, from a sporadic origin, that is to say, it may have started up spontaneously, being connected with certain unknown terrestrial, atmospheric, or planetary influences, or with chemical changes in the relations of organic and inorganic bodies, which are detrimental to animal life.

*Discussion of Probabilities.*

*1st. Origin.*—It has been stated,\* that vessels lading at the wharfs of infected places have taken the infection (here the term infection is applied to an epidemic disease) with them to distant parts ; and although the captain and crew have not fallen victims to the disease, yet, upon the cargoes being discharged in other ports, persons newly exposed have caught the disease ; and, in a climate favourable to its propagation, whole towns have occasionally been infected, and great mortality has ensued.†

\* How is Cholera propagated ? The Question considered, and some Facts stated. By an American Physician. Pp. 119

† Man is, without his will, the constant means of disseminating the germs of life as well as of disease. The progress of the settlers in the plains and forests of America has every where been accompanied by the development of new forms of vegetable life : the *plantain* was called by the Indians “ English man’s foot,” as if it sprung from their footsteps. (*Lyell’s Geol.* vol. ii. p. 82). Ramond observed, that the common nettle was constantly to be found growing in the vicinity of the *châlets* of the Pyrenees. Dr. Knox told me, that in returning from the interior of South Africa, the places of rest on the advance of the expedition were characterised by their peculiar vegetation. Lichtenstadt, the naturalist, has mentioned some curious facts of this kind ; and the geographical distribution of many insects is connected with the same phenomenon.

The poison of the disease being introduced according to this view of the subject, perhaps “condensed beneath the closed-down hatches of a vessel,”\* the germs will be diffused as if from a common centre, and they will lessen in intensity the greater their distance from the point of emanation. It is quite obvious, that when an epidemic disease, as has been stated of the yellow fever, has been imported in this way, it will shew itself with its greatest intensity in the immediate vicinity of the ship which brought it over; and that the mortality will even then continue there, unless the body has within itself the power of regenerating and reimpacting to the air the qualities which were so hurtful to its own existence.

*2d Origin.*—It is quite impossible to suppose that the town of Sunderland was in the sphere of the propagation of any epidemic disorder which would not, on traversing the sea, have also communicated itself to other towns, unless we consider that the disease follows a peculiar direction connected with some unknown law in astronomy or physical geography. But too much importance has been given to the opinion,

\* Practical Remarks on Cholera. By J. Goss. P. 23.

that if it followed the same course it hitherto had, from south-east to north-west, it would strike our shore somewhere near Hull. From the first point of departure, the *Asphyxia pestilenta* radiated in all directions with the communications of man. From the Khorasan it descended into Syria and Egypt. It reached Astrachan by the sea, and through the defiles of the Caucasus. When it reached the chalk isthmus which separates the Don from the Wolga, it ascended and descended the former river. It went into Poland, then back again to St. Petersburgh, and onward to Hamburgh; and now that it has reached Sunderland, it advances to Seaham, Houghton, and Durham, as well as to Newcastle, Shields, and Haddington. If a ruler is placed upon a map, there will hardly be found any parallelism between two places where the pestilence has existed.

*3d Origin.*—With regard to the third probability, it would have required a much more attentive consideration, had the circumstances under which the disease made its appearance been different. They are such as to preclude all possibility of doubt, and are now doubly substantiated by the progress of the pestilence in

this country. It is certain that many fatal diseases may originate under certain conditions of the atmosphere in all parts of our globe, and may be disseminated through the air, sometimes slowly and sometimes rapidly, over vast regions, the disease appearing with the same type at different places, with greater or less mortality ; and although it is certain that these diseases are propagated from one place to another, it may well be doubted whether they pass from one body to another, or through the medium of those morbific secretions of the human system which preserve and multiply the sources of infection in pestilential diseases.

Epidemics may originate from new qualities imparted to the medium in which we live—the atmosphere, or from the specific impregnation of foreign substances ; and we must study the development of the disease, like the laws of infection, as phenomena of the disease itself — evidences produced by the coincidence of a number of facts, rather than by any thing tangible, or to be recognised except by its law and properties, which are rendered visible only by their action. We have examples of diseases originating in unknown and new properties given to the air, in all those maladies which,

without any visible exciting cause, affect the inhabitants of certain districts, and yet are not endemic, or characteristic of that particular people. The existence of atmospherical influences is also shewn in epizootic diseases, or those affecting beasts, as the murrain of cattle, or the *parotitis felina*; and the same influences are well marked in the diseases of plants, as is known to every agriculturist and horticulturist. This influence may be very circumscribed: thus Forster tells us that, in the summer of 1810, almost all the rough-barked plane-trees (*Platanus occidentalis*) became diseased in the neighbourhood of London and for many miles round, very few of which, in comparison with the whole number decayed, recovered; while the smooth-barked plane-trees (*Platanus orientalis*) and sycamore-trees (*Acer pseudo-platanus*) remained healthy.

That the manner in which epidemic diseases take their origin is every where the same, might be proved by reference to any of the former plagues of an epidemical character which have visited this or other countries. Thus the great epidemic plague in the reign of Edward III. broke out almost simultaneously all over Europe. The great plague of London also broke out in

several places simultaneously ; and the plague of Rome, in the year 281, came on quite suddenly, and as suddenly disappeared.

In fact, two results must be characteristic of an epidemic. The one, its sudden appearance along a line of towns or villages ; the other, the precedence by, or at least the following of, a milder form of the disease—a different grade, dependent upon the extreme diffusion of the poisonous agency. This gyration of epitomes round a central disorder of greater malignity, was compared by Mr. Forster to the manner in which whirlwinds and storms, which latter are whirlwinds of greater extent, usually take place ; and led him to conclude, from analogy, that the morbific atmospheres in question might obey laws analogous to those of atmospheric phenomena, of which electricity is the agent. It has been attempted to mark out this precedence to the *Asphyxia pestilenta* in a bilious diarrhoea, said to be prevalent during the time of its existence in a town or village. It is, however, quite certain that such a complaint, however it may predispose to the action of the pestilence, is not a modified form of the disease itself.

Mr. Forster is the only person who, not

content with combating the opinions on the infectious characters of the disease, as has been done by many in a most prejudiced and unphilosophical manner, has accumulated the evidence of a sporadic epidemical origin of the *Asphyxia pestilenta*, and has pointed out a number of coincidental facts of terrestrial and aerial changes connected with the appearance of the disease.

The epidemic period, he says, began in September 1828, when a *lumen zodiacale* was seen stretching across the heavens. The summer of 1829 was extraordinarily cold. The winter of 1829-30 was one of unusual severity all over the world. In January 1830, there was a most remarkable *aurora borealis*; another on the 11th of August. Unusual refractions in the sun's light have been noticed all over Europe; a new volcano made its appearance on the Sicilian coast; a tremendous tornado devastated the isle of Barbadoes, and other parts of the West Indies; and, lastly, in September, an earthquake was felt at Venice and at Parma. The amount, then, of facts illustrating the existence of an extraordinary condition of the earth's surface, collected even by the indefatigable and learned Forster, is very

small; and they are such extremely remote coincidences, that I must leave their discussion with the judgment of the reader.

The simple investigation of the consequences which would result from the three only modes of epidemic origin, and the balance of probabilities in favour of such an opinion, do not leave a single doubt on the mind as to the true origin and characters of the disease. As an epidemical disease, it would be most extraordinary that it should have broken out in a small seaport town, rather than in a large and populous inland city. It is equally extraordinary that, by mere coincidence, this seaport should be in constant communication with places infected by the same disease which afterwards made its appearance in that town—that ships had actually come from infected places to this seaport—and that the disease broke out in their vicinity. It is equally curious that it did not appear simultaneously in different parts of the town, but commenced with one individual, who communicated it to others, till the links of communication were lost in the varied ramifications of the chain. And, lastly, the pestilence did not start up in isolated cases in the environing towns or in

distant parts of the country, but, after a length of time, only reached other habitations by means which in every case could be traced to transportation by human beings. Any single one of these coincidences would go a very great way, when no arguments can be derived from a simple discussion of probabilities ; but when they *all* concentrate towards the establishment of the same fact, it becomes no longer a matter of opinion or of doubt, but may be considered as a truth which has received the same precise and definite illustration as any fact in mathematical science.

There is a theory of the propagation of epidemic and pestilential diseases, which is founded upon the communication of poison by means of insect life. It is certain that, in either an epidemic or an infectious disease, there exist certain principles in the air capable of generating that disease. This, as in malaria, may be the presence of a noxious gas ; or, as in the *morbus gallicus* and certain cutaneous disorders, may be produced by inoculation of animate germs ; or, as in the plague and yellow fever, may originate in the decomposition or putrefaction of animal or vegetable substances. We should, however, philosophically, have a right

to exact demonstration of the fact, by ocular proof, before we could admit the operation of any cause like that of animate contagion. The fly of the plague has been alluded to in the most ancient and sacred records, and is known still to exist in Asia. The arrival of the *Asphyxia pestilenta* at Moscow was said to have been preceded by a flight of the insect tribe; and a gentleman has even asserted his having seen them in this country. Acquainted as we are with the insect origin of extensive blights, the millions of animalculæ that nature has provided to inhabit morbid matter and every variety of infusions, new researches may probably, in future times, throw much light on speculations of this kind, which I shall not dwell upon at the present moment, they being far too hypothetical for my purposes.

### *Discussion of Positive Facts.*

The annexed list does not contain all the persons whom I saw labouring under *Asphyxia pestilenta*, but all those whose cases I watched with care and attention, and of which I have preserved notes. I mention this because of the very great fatality of these cases, which

might be attributed to my having only considered the more marked cases as worthy of my attention. This, however, would be a wrong inference ; and the results are, as far as I am connected with them, entirely accidental, and only characteristic of the malignancy of the disease.

*Cases of Asphyxia pestilenta.*

1. Nov. 22. William Bulman. Died Nov. 23.
2. { 23. Dorothea Purvis. Died Nov. 27.
3. { 26. John Scaife. Died Nov. 28.
4. { 28. Thomas Wilson. Died Nov. 29.
5. 23. William Knell. Died Nov. 23.
6. 23. Ellen Wardell. Died Nov. 23.
7. { 24. Patrick Mullen. Died Nov. 26.
8. { 26. John Hirkin. Died Nov. 27.
9. { 24. Isabella Elliott. Died Nov. 28.
10. { 27. Thomas Elliott. Died Dec. 4.
11. { Dec. 12. Lanny Todd. Died Dec. 12.
12. Nov. 25. Mary Calvert. Died Nov. 28.
13. { 26. Isabella Cowan. Recovered Dec. 6.
14. { Dec. 1. John Cowan. Recovered Dec. 6.
15. { Nov. 26. Frederick Myers. Died Nov. 26.
16. { 26. John Morrison. Died Nov. 26.
17. 27. Isabella Watson. Died Nov. 27.
18. 27. Anna Pattison. Died Nov. 27.
19. { 27. Susan Nanson. Recovered Dec. 1.
20. { 30. Mary Freeman. Recovered Dec. 1.
21. 27. James Wood. Died Dec. 1.

22. { Nov. 22. Mary Rowntree. Died Nov. 23.  
 23. { 27. Margaret Rowntree. Died Nov. 29.  
 24. { 25. The child Woodhall. Died Nov. 25.  
 25. { 26. Louisa Woodhall. Died Nov. 26.  
 26. { 29. George Woodhall. Died Nov. 30.  
 27. Dec. 1. Jane Davidson. Died Dec. 1.  
 28. 1. William Thomson. Recovered Dec. 2.  
 29. 2. Elizabeth Fairley. Died Dec. 2.  
 30. { 1. William Bell. Died Dec. 2.  
 31. { 3. Elizabeth Bell. Died Dec. 5.  
 32. { 8. Susan Roche. Convalescing Dec. 12.  
 33. { 9. John Roche. Died Dec. 10.  
 34. 10. Elizabeth Snipes.  
 35. { 8. John Beddiston. Recovered Dec. 12.  
 36. { 10. Elizabeth Beddiston. Died Dec. 11.  
 37. { 10. John Beddiston. Recovered Dec. 12.  
 38. 9. Edward Downs. Died Dec. 10.

*Report of Cases of Cholera occurring at Sunderland  
during this period.*

	Remaining.	New.	Recovered.	Dead.
Nov. 22	51	13	5	2
23	57	8	4	5
24	56	6	5	5
25	52	11	5	3
26	55	14	4	5
27	60	10	5	4
28	61	14	6	8
29	61	12	5	7
30	61	13	3	4
Carried forward ..	101	—	42	—
			—	43

	Remaining.	New.	Recovered.	Dead.
Brought forward ..	101		42	43
Dec. 1 ....	38 .....	8 .....	3 .....	5
2 ....	38 .....	17 .....	10 .....	1
3 ....	44 .....	7 .....	4 .....	6
4 ....	41 .....	5 .....	6 .....	2
5 ....	38 .....	5 .....	6 .....	2
6 ....	35 .....	8 .....	4 .....	6
7 ....	33 .....	7 .....	1 .....	2
8 ....	37 .....	19 .....	1 .....	7
9 ....	48 .....	10 .....	3 .....	9
10 ....	46 .....	17 .....	3 .....	4
11 ....	36 .....	10 .....	9 .....	5
12 ....	32 .....	9 .....	9 .....	6
	<hr/> 223	<hr/> 101	<hr/> —	98

It may be remarked that, in the preceding table there were no cases, to my knowledge, that occurred in the parish of Bishopwearmouth, and not above six in that of Monkwearmouth.

The comparative mortality for the two preceding years was, for the same period in 1829, in the three parishes :

Monkwearmouth .....	23
Bishopwearmouth .....	29
Sunderland .....	31

In 1830 :

Monkwearmouth .....	16
Bishopwearmouth .....	33
Sunderland .....	49

In the *Medical Gazette* for January 7, 1832, Dr. Ogden gives the following table of comparative mortality between males and females, comprehending those who were known to have died of Cholera between the 28th of October and the 22d of December :

	Males.	Females.	Total.
15 and under .....	12	13	25
From 15 to 50 .....	14	33	47
Above 50 .....	37	36	73
	—	—	—
	63	82	145

It would appear, then, that some predisposing cause renders females between fifteen and fifty much more prone to Cholera than men ; and Dr. Ogden attributes this predisposition to inferior warmth in clothing. I am much more inclined to account for its cause in the charitable feelings which take them to the bedside of their suffering neighbours ; and in Sunderland, to the fact that so many women were at home—a place where the men are very seldom to be found.

Out of the thirty-eight cases of *Asphyxia pestilenta* which came more particularly under my notice, only nine appear by themselves without any precedence or sequence. William Bulman's was the first case that I saw, and

I could not obtain any information whether he had had communication with diseased persons. It was quite impossible to ascertain any thing from W. Knell, an aged man, almost without a friend. Jane Davidson lived next door to the deceased Mrs. Purvis and the child Scaife, and had been frequently in attendance upon both. Elizabeth Fairley, alluded to by Dr. Daun in the *Medical Gazette*, was nurse at the hospital; where E. Snipes was also an assistant. The other persons all lived in the direct vicinity of the disease. A few examples will perhaps best illustrate the nature of this communicability, and its effects in different houses. Dorothea Purvis, a healthy-looking woman of fifty-six years of age, living in Mill Street, and of regular habits, was taken ill on the morning of the 23d of November with the usual symptoms of *Asphyxia pestilenta*. She got through the two first periods of the disease, which were followed by a very acute inflammatory fever, from which she recovered on Saturday the 26th. The next day she had a relapse, which was attended by very great prostration of strength, collapse of the alæ nasi, and starting of the tendons of the muscles of the arm. This relapse terminated fatally the same day. John

Scaife, her grandson, five years old, living in the same house, was attacked between one and two in the morning of the 26th. The symptoms were of the worst character. Reaction, however, established itself; but the child perished on the morning of the 28th. Mrs. Scaife, his mother, who had been long labouring under a phthisical complaint, said to have been induced by grief for her husband's death, was overcome by this new affliction, and expired shortly after her son.

Patrick Mullen, an aged man, who also lived in Mill Street, was taken ill on the 20th, and entered the hospital on the 24th, where he died on the morning of the 26th. John Hirkin, a shoemaker, and who was addicted to the use of spirituous liquors, lived in the same house, was taken ill on the 26th, was removed to the hospital, and died there on the 27th.

Isabella Elliott, a very interesting little child, and one of a most unfortunate family, was taken ill on the 24th of November. Sarah Tattan, her grandmother, lived in a court off Warren Street, which is a wide and airy street immediately adjoining the barracks, where, from the excellent precaution of shutting the gates, the disease never made its appearance. She had

had an attack of *Asphyxia pestilenta* previous to my arrival, from which she had recovered under Mr. Torbock's care. Her two daughters were married; the one to a man of the name of Knell, the other to Elliott, the father of Isabella, both pilots, in the vigour of manhood and the enjoyment of good health. Elliott lived in Warren Street; Knell lived with his wife's mother. Mrs. Knell, his own mother, lived in an adjoining street (Stafford Street); and he had a sister, who was married to a person of the name of Stafford, living in Fisher Row. There was constant communication in the family, and attendance upon one another in illness. The pilot Knell, attacked during Mrs. Tattan's illness, was the first victim to the disease; and Isabella was next taken unwell. She got through the period of collapse, and lingered on for several days. At this time I was in the habit of visiting her twice, and sometimes three times, a-day, and used to see the pilot Elliott return from his fatiguing employment, and sleep by the side of the child, without being himself afflicted. It appears that, on the night of the 27th, he came home very exhausted, wet and cold. He went to bed as usual, and in about two

hours was seized with sudden giddiness, and what he termed silliness. His case, which I shall recur to, was a very striking one. He got through the period of collapse which followed, by a febrile action, which determined itself to his lungs, and he lingered on till the 4th of December, six days after the death of the little Isabella. Mrs. Knell, in the meantime, had been attacked, but I am not aware of the results. A sailor of the name of Lawrie Todd, who was as careless as many of his craft, lived in the same house as Elliott, had a diarrhoea on the 10th, which on the 12th assumed the marked type of the *Asphyxia*, and he died the same evening, in the collapsed stage. The disease next made its appearance in Fisher Row, when the man Stafford was attacked, and about the same time his brother, who had attended the pilot Elliott's funeral ; one of them fell a victim to the disease, and the other recovered.

Isabella and John Cowan were brother and sister ; they lived in Sailors' Alley, which was another great focus for the propagation of the pestilence. Isabella was the first afflicted, and slept with her brother. F. Myers and J. Morrison were both children, living in a

house crowded with uncleanly tenants, which was situated in the same street, and nearly opposite to Mrs. Purvis'—this street not being above twelve feet in width. In it also lived a Mrs. Woodville and her granddaughter, who were likewise afflicted by the pestilence, but of whose cases I did not take notes, as they were combined with old affections, which rendered them less instructive. The first person I saw on visiting this house, and nursing the little girl who died a short time afterwards, was Mrs. Cowan, and this while two of her own children were in momentary danger in the next street. Susan Nanson had been assisting in rubbing a patient labouring under *Asphyxia pestilenta* on the 28th; she took ill herself on the morning of the 29th. Mary Freeman, a stout, healthy young woman, twenty years of age, was also engaged in nursing the same person (Mrs. Wardell) as the girl Nanson. She took ill on the 26th; she recovered, but had a relapse on the 30th, which carried her off in less than twelve hours. Mary Rowntree died on the 23d of November, of *Asphyxia pestilenta*: she was the second of the family who had perished from the attacks of this fatal disease. Margaret Rowntree, her daughter, was twenty years old, of a spare habit of body, and much

depressed by the loss of her parents.\* She herself took ill on the morning of the 27th, and died the same night. Wm. Bell, a keelman, died after an illness of about twenty-four hours, on the 2d of December. His wife, sixty-seven years of age, was on the evening of the 6th at a neighbour's house, when she was taken suddenly ill, and expired on the morning of the 8th. Susan Roche and John Roche were two old people, partaking of the same bed. Susan took ill on the morning of the 8th, and John was attacked suddenly on the 9th. Both were removed to the hospital, and their children were sent to the poor-house. John died on the morning of the 4th, but Susan recovered. The Beddiston family lived in Monkwearmouth, in a house where two people had died of the pestilence when it first spread in that town. John Beddiston, a boy of seven years of age, was the first attacked. Elizabeth, his sister, twenty-three years old, slept with him, and on

\* I went the morning of Mrs. Rowntree's decease with a highly-valued friend to her house, and we were much struck with the grief of her daughter Margaret. My friend remarked at the time, that if the disease was communicable from one person to another, where debility was a predisposing cause, what a great probability of infection there was in this case. His remark was, alas! but too well founded.

the 9th took the disease in a very severe form. John Beddiston, the father, forty-five years old, a strong, muscular man, but fatigued with watching his wife in a late illness, was taken ill nearly at the same time. The father and son recovered, but Elizabeth died on the 11th.

It is needless to enumerate any more facts, as they are all of the same character, and only demonstrate that peculiarity of the disease which renders it liable, whenever it makes its appearance in a house, to carry away many of its inmates, and any that are connected with them, before it ceases its ravages. This was more particularly the case in the poor-house, in which, when it once gained entrance, it continued for nearly three weeks, carrying off on an average a person every day.\*

\* I am induced to append, in a note, a tabular view of cases which occurred in the months of July and August, under the care of Dr. Marshall, at Port Glasgow, on the Clyde; because if they were cases of *Asphyxia pestilenta* (and the most careful comparison of the symptoms detailed by Dr. M. has left hardly a doubt in my mind upon the subject), they prove, that the disease may occur in a much less fatal form than it has done in its inroads on the eastern coast of England; that it was essentially infectious; that it came over with some hemp from Riga; and that it was conquered by the natural circumstances of situation and of season.

There is one point that remains to be remarked upon, namely, the influence of similar

Case.	Name.	Age.	Date.	Termination.	Observations.
1	John Murray .....	25	July 2	Died July 5	{ Was a labourer in a sugar-house; lived at Newark, a single row of houses on the Glasgow road.
2	A young girl .....	22	6	Recovered	Lived at Newark.
3	— Boog .....	8	7	Do.	Lived under the same roof as Murray.
4	W. Dallas .....	30	8	Do.	
5	Mrs. — .....	36	8	Do.	
6	Nancy Kitchen ...	24	10	Do.	{ Worked in a flax-mill. Had sat up with J. Murray; 9th, washed the sheet which had covered the body.
7	— Kitchen .....	9	10	Do.	{ Niece to Nancy; works in the same mill.
8	— Aiken.....	28	11	Do.	{ Weaver in a factory attached to the flax-mill.
9	James M'Lachlan	25	11	Do.	{ Labourer in the sugar-house; had sat up with John Murray.
10	Mrs. Fisher. ....	22	13	Do.	
11	A young lady .....	21	15	Do.	Lived at Newark.
12	Mrs. — .....	38	16	Do.	Worked in the flax-mill.
13	Mary Hunter .....	16½	17	Do.	{ Worked in the flax-mill; had nursed Nancy Kitchen.
14	Mrs. — .....	36	17	Do.	Lived at Newark.
15	J. M. (a stout boy)	12	17	Do.	Attending school.
16	Mary Whiteford...	13	17	Do.	Lived at Newark.
17	A young man .....	16	17	Do.	{ Was clerk in the sugar-house where Murray and M'Lachlan were employed.
18	Sarah M'Arthur...	21	18	Do.	{ Worked in the flax-mill, and slept in the same bed as Mary Hunter.
19	— Dickson .....	28	19	Do.	{ Weaver in the factory attached to the flax-mill.
20	Mrs. Millar.....	38	19	Do.	
21	A young gent. ...	16	20	Do.	
22	His sister .....	14	20	Do.	
23	Captain — . ....	40	20	Do.	
24	Jessie Gillepsie ...	17	Aug. 2	Do.	Lived at Newark.

*Obs.*—The flax-mill is situated in that part of Port Glasgow called Newark, to which the disease continued principally confined. The sugar-house is close to it. The disease appeared in Dr. Marshall's fa-

circumstances upon predisposition ; and it has been advanced, in considerations of this kind, that many diseases, not essentially infectious, may become so, when pent up in an impure and stagnant air, in crowded streets, dirty houses, or ill-ventilated situations. This has more particularly been remarked with regard to hospital diseases. But it is sufficient to prove that there is something more than this communicability, originating in a tainted or corrupted atmosphere, to shew that a person moving out of that atmosphere can either be attacked by the disease, or communicate it to others. And this is very well exemplified in the transmission of the disease to Houghton and to North Shields ; in both of which cases persons travelled on foot from Sunderland, and were subsequently attacked by the disease, and

mily seven days after his first visit to J. Murray. Dr. M. never, during his practice in Port Glasgow (except in the years 1825 and 1826, when there occurred one or two severe cases of a doubtful nature, but at the most only resembling the Indian epidemic Cholera), met with any cases resembling those whose names are in the above list.

Dr. Marshall was exposed to the same obloquy as the medical practitioners in the east, when he laid these cases before the privy council ; more especially as it was stated that the disease had come from Riga. Dr. M. had never stated this ; he alluded to the cases originating at a flax-mill which was supplied from Riga with hemp : and the inference was, I suppose, drawn by all who were acquainted with the facts.

communicated it to others. There are also several of the cases mentioned in my list, which, though occurring all in the town of Sunderland, were yet removed from any source of infection that could have originated in a tainted atmosphere.

There are two other modes by which the disease appears to be propagated; the first by clothes, wearing apparel, &c.; and the other, a novel feature in the history of disease, by emanations from the dead. Few cases of communication by objects of dress came under my notice; but they were so striking, that they at once brought conviction of the fact to my mind. The mother of Mr. Embleton, one of the surgeons of Sunderland, whose practice lay most among the patients afflicted by the pestilential disease, took the disease and died. The washerwoman of the family was Louisa Woodhall, a woman of forty-two years of age, who lived in the upper part of the town, in an airy situation. Mr. Embleton's clothes were sent to the washerwoman's; and there being much on hand at the moment, they were thrown beneath the bed occupied by herself, her husband, and a young child. The child was first attacked by the disease, and fell a victim

to it. Mrs. Woodhall was taken ill on the 19th of December, and died after an illness of thirteen hours. George Woodhall was taken ill during the removal of his wife's body, though he had complained of no previous indisposition, and died after twenty-four hours' illness. The disease, it was currently believed, was taken to the poor-house by a large easy chair, which had been provided, and was used, to carry patients from their homes to the hospital, and which in the evening was taken to the poor-house. Mr. Kennedy, whose important labours on this malignant disease are so well known and so deservedly appreciated, relates a case in which the disease was first taken to Gateshead by a woman of the name of Hindmarsh, who had visited the Sandgate, the district of Newcastle where the disease prevailed most at that time, and was herself taken ill, and died the next day. Her husband left the house where she died, and was admitted, after being purified, into another lodging. His box, however, was neglected to be purified, and was placed by the side of the bed in which himself and some other inmates of the house slept. The consequences were the dissemination of the disease in the house, of which several persons were

the victims. One young man went to South Shields, after being infected by the disease, and died shortly after his arrival there.

The communicability of the disorder from connexion with the dead is also supported by some very satisfactory proofs, but does not admit of our placing the confidence we do in the other general infectious characters of the disease, from the liability those who come into the vicinity of the dead are also in of coming in contact with the morbid effluvia of garments or other objects.\* It became latterly an opinion so generally received in Sunderland, that the greatest precautions were enforced. Bodies were not allowed to be kept more than twelve hours; and a separate piece of ground was allotted for their reception. The funeral service was not read in the church, and the coffins were not allowed to be carried shoulder high.† In

\* Dr. Becker says, that repeated experience had shewn, that at Berlin the manipulations connected with the preparation of the dead bodies for the funeral, and still more the assemblies of friends and others in the habitations of the dead, have frequently led to a propagation of the Cholera.

† The duties of a clergyman in times of pestilence are peculiarly severe, and require the exercise of all that resignation and fortitude which are characteristic of his profession. I

Sunderland, three different under-bearers of three different diseased bodies fell victims in succession to the disease, within twelve hours after the bodies were buried ; and on the 8th December, Mr. J. Browell, the master undertaker for the parish burials, fell a victim to the disease. When the first case of the malady occurred at Penshaw, the joiner of the village was employed to make the coffin, and assisted in nailing up the corpse, and he fell a victim to the disease. William Thomson, it is averred, had no communication with persons labouring under the disease, but the day before his illness had been watching the inhumation of the dead—always a source of mournful interest in a town ravaged by a pestilence. Mr. Kennedy also relates the following case of communication after death : Some time ago a woman died of Cholera, in a place called Washington, about six or seven miles from Sunderland. Two men, who attended the funeral of this woman, were soon afterwards seized ; one died, and the other heard of a worthy pastor of Monkwearmouth who was found praying outside the door where a patient was dying of the Cholera within. Others have, on the contrary, exhibited throughout a fearlessness as remarkable as it was creditable to them.

recovered. The mother of the individual who died resided in Gateshead-fell, a lofty and airy situation, and she insisted upon having her son's body brought home to the fell, in order that it might lie in her house for the usual period preparatory to interment. The body was accordingly brought home, and with it the clothes of the deceased. From the house which received the body, as from a focus, the disease is said to have spread to the houses in the immediate vicinity.

It will be at once perceived, then, that this discussion of positive facts negatives the misrepresentations of those who are blinded by prejudice, and corrects the errors of those who have been misled in their judgment. Statements are made in opposition to the infectious nature of the disease, which are silenced by a single fact, and yet we see them daily repeated. Thus, it is asserted that the malady is only infectious while the same atmosphere which gave the person the disease remains around him. But if a person becomes infected, and travels several miles, carrying infection with him, would it be asserted that he bears the same atmosphere, like a halo, around him? It has been stated, with the same carelessness of

facts, that the disease was epidemical. Was there ever a case of *Asphyxia pestilenta* in a dungeon or a light-house? If an epidemic influence was abroad, the chances of infection would be the same by the bedside or on the town-steeple. But were these the phenomena of the disease? The immunity of the many, which is the great consideration with Mr. Searle, Bell, Lefevre, and other observers, does not disprove the fact, though it throws light upon the characters of the pestilence, just as much as when its fury was developed in Christmas week in Gateshead. Were the causes to be sought for in the air, or in the dissipation of individuals? And is the safety of medical attendants to be explained by denying the infectious nature of the disease, or by ascertaining if they do not, by their habits of thought and regularity of life, oppose a vital energy to the poison of disease, which does not exist in those whom they see the victims of a pestilence around them? The researches of Dr. Antomarchi, and others of that character, tend to throw no light whatever on the disease; nor does it appear to me that the arguments of any man, however great the authority of his name may be, deserve the slightest attention, when he proceeds so unphi-

losophically to prove a question of the highest importance to science and to humanity.\*

\* Upon this subject I shall quote the words of Baron Larrey, whose knowledge of the world is as much superior to that of a young observer like myself, as is his vast and unequalled professional experience.

“ It is quite useless to repeat the experiments which some unreflecting medical men have made, to prove that these diseases are not contagious. Most of these experiments are suggested by ostentation or political motives : they are all ridiculous ; and it would be easy to prove it by simple reflections.

“ Plague, small-pox, measles, &c. communicate themselves as well by the morbid miasms exhaled from the body of the afflicted, when the disease has arrived at its third period, as by a more or less lengthened, mediate or immediate, contact. These miasms may pass according to an infinity of circumstances into the body of healthy individuals ; as much by respiration, or the pores of the skin, as by the inoculation which may be made with the matter of the exanthema under the epidermis by means of a lancet or any other instrument.

“ Thus, the true method of making these experiments (which I should advise no one to do) would be by a proper incision in the skin, and inoculation with the matter of exanthemata, as done by Dr. White, physician to the English expedition in Egypt, who died the ninth day of his inoculation ; or in other diseases, to place one’s self in contact with the diseased person, under the covering of the bed, as was done by the celebrated Valli, an Italian physician.

Mr. Bell says, “ I am persuaded, indeed, that the almost universal belief of Indian practitioners that the disease is *not* contagious, results from a conviction which every medical man who has done his duty to Cholera patients must feel, that had the disease been communicable from one individual to another, he could scarcely by possibility have escaped.” I agree perfectly with Mr. Bell—nay, it is a feeling I have myself experienced, but repressed it, because irrational. May not the body get inured to disease by frequent contact? I have seen persons in whom this incapability of satisfying themselves of the causes of their

“ The degustation of the excremental substances of the diseased, besides that it is disgusting, can have no results; for the urine or the excrements of these individuals necessarily destroy or neutralise those particular miasms of which we have spoken, and for the same reason deprive them of all contagious properties. The blood itself used in inoculation can produce no other results.

“ It is, then, superfluous and ridiculous to make such experiments.” \*

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\* Dr. C——, of Berlin, died three days after tasting the fluid of a cholera patient: on his death-bed he warned, in the most serious manner, another young physician, who had made the same absurd experiment as himself. The latter was taken ill the same evening, but recovered.

— See Becker’s Letter.

exemption from disease has led them, when surrounded by evidences, to doubt its infectious nature: the much-quoted Zoubcoff of Moscow is an example of this kind; and yet what unprejudiced reader can peruse his long list of persons whose duties brought them in connexion with the disease, and who yet were not infected, and not see the fallibility of such an argument? In towns afflicted by this pestilence, sometimes about thirty to a thousand fall victims. Suppose the remaining nine hundred and seventy had been exposed to the same influence, and were not infected, would this prove that the disease was not infectious? But even medical officers were not safe; for, according to the Madras Report, quoted by Mr. Bell, the medical establishment in that presidency was kept up at two hundred commissioned officers. In the five years during which the Cholera occurred there, thirty-three medical officers were known to have had attacks of the disease, of whom thirteen died. Mr. Bell says, “A high-minded gentleman, notwithstanding a belief in contagion, may boldly do his duty to a patient labouring under a pestilential malady.” I do not think that belief in contagion has much effect upon a person’s conduct: it renders the

first acquaintanceship a little distant ; but the escape of one or two cases emboldens the practitioner to think that he is seasoned against the disease ; and this knowledge is much less harassing than the supposition of being constantly and every where under an epidemic influence of a most deadly and mysterious character.

There is one more subject, which is immediately connected with the infectious properties of the disease, I wish to remark upon : it is the quarantine measures which it may be necessary to put in force by land or by sea. Public authorities have to choose between two evils : on one side is infection, and on the other wretchedness and want, resulting from stagnation of trade. The measures that are adopted should, then, as far as possible, be in a just medium between the two. *Cordons sanitaires*, or a line of soldiers encircling a town or village, is an unnecessary precaution, because it has never yet been found effectual. It is, besides, a measure which entails too many deprivations ever to merit the attention of our government. Not so, however, are the precautions which it will always be necessary to take to prevent infection reaching barracks, prisons, hospitals,

poor-houses, and other establishments where a multitude are accumulated together.\* The most rigorous quarantine should be kept up in such places while the pestilence is in their vicinity. I have already given my opinion as to the utility of segregation in individual cases. Quarantine by sea is entailed, as well for our own safety as for the continuance of our commercial relations with other countries. The most important question connected with it is, the period of its duration ; and every thing tends to prove that the virus of the *Asphyxia pestilenta* is capable of lying a very short time latent in the human body. Perhaps the most instructive results on this subject are those obtained by my friend, Dr. Becker, at Berlin, and communicated by him to Mr. Chad, his Majesty's minister in that capital.

From August 29 to September 26, there have been reported cases of Cholera in Berlin

\* In a disease which runs its course so rapidly as Cholera, the successful treatment of the poor at their own houses can never be anticipated. The prompt and unceasing attention necessary to ensure recovery, can only be found in places expressly prepared for the purpose. In the Cholera Hospital at Gateshead, it was found necessary to treat as out-door patients all who were afflicted with simple diarrhoea.

770. During that period, a second case has happened in the same house where one case had been reported :

After one day .....	65 times.
two days .....	34
three days.....	23
four days .....	16
five days .....	21
six days .....	7
seven days.....	3
eight days.....	2
nine days .....	0

The Russians have adopted the opinion, that three days of observation are sufficient to prove the existence or not of the seeds of the disease in the human body. This, though the minimum of quarantine, I have no doubt will hold true on shore; but a man travelling by sea is liable to exposure to new causes of infection, which he himself carries with him.

The Prussians have deemed five days a sufficient term of probation for animate and inanimate objects. Physicians sent into Hungary by one of the German states, reported that six days was the longest interval that they had observed to exist between the ab-

sorption of the virus and the breaking out of the disease. Processions, which bring together a great crowd of people, took place at Vienna. The first was on the 5th of September, the second on the 6th, the third on the 7th. On the 8th, the annual procession of St. Peter took place in the heart of the town; and on the 9th there was another procession. From the 12th to the 13th, the number of sick took a prodigious increase, and they augmented daily afterwards. It would appear from this, that the action of the virus develops itself between the third and the fifth day.

For two reasons, in all infectious diseases the communicability will exist longer in apparel, &c. than in the human body: 1st, That apparel, &c. may be shut up in a box or the hold of a vessel, and not exposed to any current of air or change of situation, like a human being; and, 2d, that the vital powers of the human body always assist in throwing off disease, if the person is not attacked by it. To this fact is to be attributed the communicability of the disease by a ship, on board of which no one has been unwell; as an individual may convey an infected chest into a house without himself being a sufferer from disease.

With regard to persons, it appears that six days is a sufficient period for quarantine restrictions; but in goods and apparel, more especially in suspected cases, the most improved methods of fumigation which have been furnished by modern science should be continued to be put in practice. We had medical men in this country who took advantage of the respect paid to their names to betray themselves into the absurdity of prophesying that the pestilence would never come into this country—or if it did, that it would come shorn of its fatality. How short a time it has required to prove the fallacy of such dogmatism! We have had others who asserted that it was an epidemical complaint, confined to low, unhealthy situations, and that it could only spread in such places. Since it has been in this country, it has always gone along the high roads of the communication of man,—to Newcastle, to Haddington, to Morpeth, and to Houghton and Wreckington. It has left insalubrious towns, to affect healthy and airy villages—it has exhibited itself by the banks of the river, and in the highest habitations (Gateshead-fell) in the north-east of England. And with these facts before us, he would be

most guilty who regarded the assertions of the ignorant or the mercenary, to the neglect of that vigilance and exertion which is demanded by every circumstance contained in the history of the propagation of so fatal a disease.

### III. PHYSIOLOGY AND PATHOLOGY.

It is not at all to be wondered at, that so much has been written in explanation of the physiology and pathology of the *Asphyxia pestilenta*. It is a disease which is more precipitant in its effects than the plague ; the malady shews itself sooner, makes a more rapid progress, and death or recovery are generally much quicker. It came like a torrent across the great continents of Asia and Europe, and that at a period when science was stated on all hands to be in the highest state of perfection, and the human mind full of intellect, and powerful with knowledge. Yet the quantity of information which was obtained of this new and fatal disease, by its dissemination in places where the test of this improved science and increased power could meet its application, amounts almost to nothing ; and it is honourable to our country, that, with the difficulties opposed to the examination of

the dead, valuable chemical experiments have been made at its first appearance, and that the stern good sense of some solitary, though no less powerful, minds have accumulated such facts as leave very little to be desired on the score of the pathology of the disease; though we may long, as in many other cases, remain in the dark with regard to the agency by which its phenomena are induced.

It is evident, that the first consideration is, whether the *Asphyxia pestilenta* is an insidious or a sudden disease? In the first case, it may be the cold stage of a fever without reaction, or it may be an affection of the gastro-enteric mucous membrane. In the second case, it must be an influence that at once affects those structures in more immediate connexion with the functions of vitality; and though in these cases its approach may sometimes be gradual, yet it must also be sometimes immediate, before the liability of the body to be at once afflicted by the disease without undergoing any previous pathological changes can be demonstrated. What, then, are the first symptoms of the disease? They are a continuous diarrhoea, a sudden sickness, giddiness, prostration of strength, with vomiting and purging; they are, the sud-

den evacuation of a very large quantity of rice-water fluid, with very great loss of strength; or they are the sudden failure of vitality. Now, if we admit, according to Mr. Searle's notion of the disease (and he has had a very great experience in this malady, having seen it in many different places), that the cause of *Asphyxia pestilenta* is a miasm, of the nature of, if not identical with, malaria, but of a more virulent character than ordinarily gives rise to fever; possessing an influence which, being superadded to the amount of causes which ordinarily give rise to fever, adds malignity to their effects, and so subverts or depresses the functions of life, that the conservative energies of the system are rendered unequal to the development of reaction or the febrile condition;—we shall have three well-marked phenomena as characteristic of the disease: it will be epidemical; it will only exist in localities fit for the development of the miasmatic influence; and it will, with very little variation, present only one train of symptoms, which would only include the two first of the *Asphyxia pestilenta*, even though it may be possible to explain the loss of pulse and animal heat, and the congestion of the large blood-vessels, which occur afterwards, by

the supposed influence of a poisonous miasm—which we willingly admit; our only object, for the present, being to ascertain if, in the first steps of the disease, it exhibits characters which uniformly bear out any view which may be advanced upon its nature. The after-symptoms may be accounted for in fifty different ways; and thus Mr. Searle obtains no additional illustration of his theory by *post mortem* examinations, which exhibited appearances in the mucous membrane of the bowels, which, he says, almost constantly attended the typhoidal fever of this country; for in this country—where the typhus has taken up its residence, a phenomenon which the same disease has exhibited in no other part of the world—the *Asphyxia pestilenta* terminates in malignant febrile action, which, as already alluded to, bears constantly a typhoidal character.

The next supposition is, that of a catarrhal affection of the gastro-enteric mucous membrane—a theory much in favour in France, and which is supported in this country in an able little work by Mr. A. C. Turnbull. It will always be observed in the writings of medical men, so great is the influence of locality upon the *Asphyxia*, that their views of the disease are generally founded upon the type which it ap-

peared inclined to take in the district where it came under their observation : thus, at the island of Mauritius, Dr. Michel took it for a typhoidal affection ; at Bourbon, M. Labrousse considered it a species of ataxo-adynamic fever; Dr. Gravier, physician at Pondicherry, called it gastritis ; and Keraudren, who admits that the first symptoms are nervous and spasmodic, supposes them to originate in an affection of the gastro-enteric mucous membrane. In the south of Germany, and in Austria, the disease has been accompanied by the common Cholera.\* In Berlin it was accompanied by the endemic intermittent fever of the country ; at Warsaw it co-existed with the typhus ; and in this country it has evidently been combined with the diarrhoea of poverty and cold, and terminated in the now endemic typhus.

Catarrh is an affection of the secretory

\* “ The ‘sporadic Cholera’ had prevailed since the 15th of August in Vienna ; the Indian Cholera having, by order of government, *halted* on the Austro-Hungarian frontiers. Nevertheless, deaths were occurring in Vienna in great numbers ; the mortality was daily increasing, but business went on as usual ; when, on the 14th of September, after a violent rain and storm, and after numerous casualties among the highest ranks of society, the ‘ infallible ’ imperial government declared, that on that day the *epidemic* Cholera had arrived ! ”

— F. W. BECKER

apparatus of the mucous membranes, which, without inflammation, causes the secretions of the membranes to be both increased and depraved. Common diarrhœa is an example. In violent catarrhal affections of the gastro-enteric mucous membranes, the size of the pulse and heat of the skin are diminished ; and great venous congestion is said to be always found in the viscera of the thorax and abdomen of those who have died of such affections. This is the *rationale* of Mr. Turnbull's views, and he applies them with much ingenuity to explain the etiology of the *Asphyxia pestilenta* ; but, independently of the difficulties which such considerations present in accounting for the phenomena of this disease in its more advanced periods, the first symptoms do not coincide with what we should anticipate from a disease originating in a morbid alteration of the mucous membranes of the stomach or bowels. In this case, the disease would almost always be preceded by diarrhœa or vomiting ; its influence would be circumscribed and confined—and this I do not state as a mere assumption, but as a fact proved by the history of medicine ; and its termination would in most cases be different. Mr. Turnbull's chemical researches on the secretions of a choleric

patient coincide with what has been found to be the case in this country: now, does he suppose that a catarrhal affection of a membrane shall so particularly act upon the vascular system as to produce those changes which, notwithstanding the congestion said to exist in all violent catarrhal affections, and which are known to accompany some fevers, have yet never been found affecting with that rapidity, and carried to the same extent as they are in this pestilential disease?

Messrs. Kennedy, Orton, and others, founding their opinions of the disease upon the supposed influence of a morbific poison upon the nervous system, have developed their views, more especially the two former, with much ingenuity and sound reasoning. Mr. Pinel has referred this influence to the trisplanchnic nerve, and Kerauden to the trisplanchnic and pneumogastric; while Mr. G. H. Bell has considered it a suspension of power, or failure, in the great ganglionic or sympathetic system of nerves. It has been remarked, that to say that any disease is owing to diminished nervous energy, is only using a peculiar phraseology, for we know nothing of diminished nervous energy except by its effects: so, I would

answer, we know nothing of any of the animal functions, in their healthy or morbid action, but by their effects. These effects are the facts of physiology, or the symptoms of disease; and if in fever or in catarrhal affections of the gastro-enteric mucous membrane, we have a peculiar train of symptoms present which are not always present in *Asphyxia pestilenta*, or they follow a particular succession, which is reversed in the pestilential disease; then we must search for a cause that will serve to explain the anomalous symptoms, and make us acquainted with the true character of the disease.

The insidious nature of the *Asphyxia* is evidenced in two peculiar symptoms,—the existence of a previous diarrhoea, and the sudden evacuation of a fluid which we know to contain the constituents of the healthy blood. With regard to diarrhoea, Dr. Becker has very ably pointed out three different sources of this phenomenon: 1st, The attention paid, during the existence of the pestilence in a town, to all derangements of the bowels, which thus bring them under the notice of the medical men; 2d, Derangements of the digestive organs, actually brought on by the sudden change

of diet and regimen, which most persons think it necessary to have recourse to at the approach of the disease ; and, 3dly, from an epidemic *malaise*, produced by the influence of the mind upon the body ; and which Dr. Becker calls pseudo-cholera. "One must have experienced," says this ingenious young physician, "in one's own person the singular feelings of a first week of Cholera, in order to conceive it possible how much, not only hypochondriacs, but individuals in excellent health of body and mind, free from all fear and anxiety, may thus suffer, merely in consequence of consciousness being directed towards the functions of digestion. In some persons, a feeling of discomfort has continued for days and weeks : they have been languid, little inclined to their usual occupations ; the stomach, as well as the lower part of the intestines, have been the seat of the unusual sensations ; sleep was disturbed by the involuntary thoughts of the approaching disease. In others, a sudden attack of anxiety, oppression of the chest, shivering, coldness of the extremities, has supervened, and caused great alarm to the patients and to their friends." It is impossible to say whether the symptoms here detailed by Dr. Becker originate in the first

seasoning of the nervous system to the influence of the disease, because we cannot assert that a man with his ear on the bosom, or his hand on the arm of a patient, is not exposed to that influence, or whether they are symptoms derived from the influence of the mind on the body. Dr. Becker remarks that they occur where there is neither fear nor anxiety; the thoughts were involuntary, and interrupted sleep; and the same writer says that he himself was afflicted after the first dissection by a peculiar excitement, followed by derangement of the digestive functions, which *increased and decreased as he was more or less exposed to the effluvia of Cholera.* I have seen individuals affected by diarrhœa the whole of next day after an examination; and the possibility of a person, as had sometimes been observed, walking home when the pulse was almost imperceptible, was often in Sunderland a source of that kind of merriment which is indulged in even in the hour of dread.

There is also, no doubt, where the pestilence prevails, a frequent occurrence of diarrhœa, which may unquestionably be a mild form of the disease. And it was observed that, in the

hospital No. 1 at Berlin, of seventy to eighty attendants, eleven had *Asphyxia*, and thirty-five others this diarrhoea, with vomiting, &c.

This leads me to the more important consideration of the sudden attack of the disease; and during its prevalence in the town of Sunderland, I only heard of one case of that kind, and which I visited in company with Dr. Clanny. This was a case in which the patient, a strong, healthy sailor, was putting on his hat to go on board ship, when he fell suddenly down, having lost all muscular power, which symptoms were followed by violent pain in the præcordia, and constriction, without purging or vomiting. This man was bled to the amount of sixteen ounces: he had sinapisms placed on the region of the stomach; and he convalesced by the next morning, under a very simple treatment. Mr. Kennedy gave it me as his opinion that this was a decided case of *Asphyxia*, and I think there can be no doubt on the subject. It appears that, as an insidious disease, those chemical changes, or that morbid action which produces an alteration in the nature of the blood, may go on almost without disturbing the health of the

person, till a sudden call to the stool produces an immense evacuation, leaving the patient almost lifeless. Dr. Lefevre describes some cases of this kind observed at St. Petersburgh. Now, if this action is one of such an insidious nature, might it not be possible that a slight diarrhoea having made its appearance, the serous fluid, with its flocculi, might, as secreted, be emptied out of the intestines; but, in the meantime, the blood, deprived of its fluidity, would accumulate in the larger vessels, till, the heart and lungs being no longer capable of performing their functions, the patient drops in a total state of asphyxia? That this is not the case, but that the blow given is to the nervous system, could be at once proved, by ascertaining that no previous diarrhoea existed—that at the time of attack there was no great accumulation of the fluid part of the blood in the stomach or intestines—or that, as it appears from the Indian reports, the effects of infection were far too immediate to give time for any such changes to take place. With regard to the latter fact I had no direct proof, and the authority must remain with the Indian practitioners; but with regard to the two former, I think them quite sufficient to satisfy me that

such explanations were not sufficiently satisfactory, and that the attack of the disease could only be accounted for by an influence pervading the great ganglionic system, the centre of organic life.

The rapid diminution of the pulse, and the great peculiarity of expression in the countenance, when a suspicious diarrhoea exists, are sufficient warning, in a place where *Asphyxia* prevails, that these are preliminary symptoms; but when the stools are simply bilious or feculent, and are not accompanied by loss of pulse or diminished heat, we cannot be warranted in regarding them as originating from the pestilential influence. These considerations are not only of importance in the etiology of the disease, but very much influence the treatment, which, in the one case, will be to remove the predisposing cause; in the other, to act with the caution necessary when we know we have a noxious poison to overcome.

Dr. Wilson Philip, as before remarked, has observed that all the symptoms of the *Asphyxia pestilenta* are the necessary consequences of any cause capable of making the peculiar impression on the system, which its cause, of whatever nature it may be, evidently does. And thus,

if we keep this principle in mind, it is comparatively easy to follow the symptoms in their development—to ally them to the resulting physiological phenomena—and to point out their relation to the pathological appearances presented after death.

It must be premised, as resulting from the observation of physiologists, that it is in the extreme parts of the nervous and circulating systems that these structures are most intimately connected. The extreme parts are the surfaces both internally and externally, that is to say, the skin and the secreting surfaces; and thus it is in the most minute branches of both that the changes on which the various functions of life depend take place, and, consequently, that the greatest sympathy exists between them. We have, in the influence of fear or of cold upon the human body, in determining increased secretion of the bowels, an example of the influence of the nervous system on the functions of the secreting surfaces; and we have an example of the same influence on the capillary vessels, in the phenomenon of blushing. And thus in the *Asphyxia pestilenta* we have an influence affecting both extremities of the nervous and circulating systems, in the affections

of the skin and bowels. Independently of the other theories of the nature of this disease already disposed of, as not even embracing the several symptoms which simultaneously make their appearance in *Asphyxia*, it might be supposed that this anomalous abstraction of the chemical constituents of the blood, as exhibited in this pestilence, might be induced by a morbid action, which takes place only when congestion in the blood-vessels has rendered circulation almost null and nugatory. But that this is not the case, is demonstrated in the incipient stage of the disease, when the circulation is diminished at the surface, but not in the central organs ; and that this insidious action of capillaries by a long time precedes, or even exists without, any very evident symptoms of internal congestion. At the same time that this sympathy of the extreme of the nervous and circulating systems shews itself, by morbid action, in the mucous membranes, similar phenomena take place, and are accompanied with different symptoms, on the surface of the body : the loss of power in the arterial capillaries affects two systems, the excretory and the venous ; perspiration is abundant, cold, clammy, and unnatural ; animal heat is deficient ; there is loss

of colour, and pallidity of countenance; the blood stagnates in the extreme vascular parts; and this is more particularly visible in the ring round the eyes, the nails of the fingers, the lips, the nipple of females (*existat idemque in glande penis*); and this is accompanied by a general want of feeling, a dulness of sensation over the whole surface; which loss of nervous sensibility is communicated to all the senses. There is dimness of sight, ringing, from loss of tone, in the ears, and, probably, taste and smell are slightly affected. Notwithstanding the loss of the pulse, and the languid beating of the heart, the opponents of nervous influence have supposed that increased capillary action is necessary to produce the abundant perspiration characteristic of certain stages of the disease; but the most superficial examination of this sudden exudation of cold sweat from the pores of the skin, would at once shew the observer that it is a momentary and a local effect, often-times confined only to the more sensible parts of the body, and producing the same effects by physical influence upon the nervous system, as we see produced by mental causes, as fear, when the sudden stoppage of circulation, and the moral influence upon the sympathies of the

extreme vessels, produces an abundant cold sweat over the body. Dr. Wilson Phillip has pointed out, in his treatise on the Preservation of Health, and particularly the Prevention of Organic Diseases, the distinction, both in the nature and symptoms, of congestion and inflammation, that is, a morbid distension of the larger capillary vessels of the part. "The latter appears with active and decisive symptoms, because the failure is in those vessels which immediately co-operate with the nervous power in all the functions of the system; the former, with those of a less active nature, because the failure is only in the vessels which convey the fluids to the capillaries, which, if they retain their power, are more or less capable of their function as long as the remaining power of the larger vessels is capable of supplying to them any portion of blood." The congestion of blood which takes place in this pestilence may be accounted for, independently of nervous influence, by the constriction which takes place at the surface, where animal heat is evolved, and arterial becomes venous blood, naturally inducing a languid circulation, the bad consequences of which fall chiefly on veins, because the circulation is slower in them. Di-

latation of veins, and congestions of blood, are more particularly liable to take place in those which are destitute of valves, and in which the motion of the muscles cannot assist the circulation. The other cause is the change in the nature of the blood, evidenced in the chemical characters of the secretions, which we find to contain not only a part of the fluid and solid portions of the blood, but a part of its salts, more especially its alkaline constituents.\* This great loss of fluidity would of itself readily account for the congestion which, in *post mortem* examinations, is found to have taken place in the heart and larger vessels. But it appears from the rapidity with which the symptoms of *Asphyxia* develop themselves, the languor of the heart's action, the loss of pulse, and the obstruction of the venous circulation, that are almost immediately perceptible; the paralysis of the glandular systems, and the suspension of all the organic functions; the continuance of the sensorial and respiratory powers after the failure of the circulation in the trunk and extremities; and the fact that the symptoms of

\* See Dr. O'Shaugnessy's and Dr. Clanny's experiments detailed in "The Lancet," Nos. 435 and 436.

the disease are every where most prominent where the branches of the sympathetic system are largely distributed ;\* that we must refer the incipient cause of this congestion, with the symptoms just recapitulated, to the influence of a poison destructive to vitality, and of the nervous action, upon which depend the functions of organic life.

The connexion of the organic system of nerves with the respiratory and sensorial functions is, it is well known, maintained through the medium of the trisplanchnic, the fifth and sixth pairs, and the par vagum. I am willing

\* Baron Larrey says, the diminution of the pupil, or contraction of the iris, is the result of the nervous influence of the ganglionic nerves, which transmit sympathetically their morbid condition to the ciliary nerves furnished by the ophthalmic ganglion. Mr. Bell remarks, it would even appear that the sinking of the eye may be ascribed to the failure of the energy of the sympathetic system ; for Dupuy found that the division of the superior cervical ganglion of the sympathetic nerve in a horse, was immediately followed by sinking of the eye in the socket. And may not the turning upwards of the eye depend upon the same morbid influence, communicated to the muscles of the eye-ball by the supra-orbital branch of the fifth pair, which goes to join with the sixth before it sends a branch to the lachrymal gland, also affected in this disease ?

to give Mr. G. H. Bell the credit which is due to him for his correct theoretical views on the nature of the *Asphyxia pestilenta*; but it surely did not require him to inform us that these are merely nervous communications between the different powers of the system, and that his researches on Cholera led him to the discovery of this fact. I do not know if there are any anatomists yet so prejudiced as to think that the sixth pair, or any other nerves, give origin to the ganglionic system; but of this I am certain, that there is not a comparative anatomist of the present day who ever entertained that idea, or did more than consider them beautiful illustrations of that law of nature, *qui non fit saltus*, and establishes remote sympathies between the most distant organs.

It has been premised in the history of the symptoms, that, in the first stage of coldness, prostration and evacuations might be succeeded by a mild febrile action and rapid convalescence. If the vital energy is sufficient to overcome the morbid influence which has destroyed organic sensibility, the functions of the internal and external surfaces will be restored, the central organs will continue their functions unimpaired, an equilibrium will be established between the

extreme nervous and vascular systems, a healthy perspiration will break out, the body will regain its natural temperature, and this will be accompanied by a reaction, in which the increased dilatation of the capillaries will induce increased heat, colour, and secretion ; and these inflammatory symptoms will be the more intense in proportion as the shock has been more formidable and the vital resistance more extensive.

If this salutary effort of nature, however, does not shew itself, the intensity of the collapse increases with the diminished vitality and obstructed circulation. The same actions which on the surface produce the sensation of cold, produce internally the death of the part ; and the superficial muscles, the various solids of the human body, and more especially the extremities, are in a state of inanity approaching to death ; the most intense heat being often as uninfluential as the most powerful stimulus. Vesication cannot be produced ; and the proximity of a vessel of boiling water is not felt. In muscular subjects there is a strong vitality which resists this state of collapse, produces violent spasmodic action and jactitation, in which the muscles are sometimes drawn together in knots, or which in other persons may terminate

fatally. The violent pain which exists in the region of the præcordia cannot be seated in the stomach, for the pain is not increased by pressure: it catches the breath by sympathetic influence, and there is no inflammation of the gastro-mucous membrane. It must therefore be seated in the great nervous plexus which occupies that situation; and this corresponds with what we know of the functions of the ganglia, which may be separate centres of action; and also with the theory of the disease offered by the advocates of a nervous influence.

The respiratory functions are now affected, the voice becomes a whisper or a low whine, and the breath is cold and damp, "a tiny blast." The changes which take place in the lungs, and the accumulation and stagnation of the blood in them, by preventing the *resonance* in the cavities, will readily account for this; but there is further the failure of all secretions, which may influence the transport of sound along the ramifications of the bronchiæ; and even the pleuræ are uniformly found remarkably dry, though often there has been no engorgement of the substance of the lungs. It is, however, as we have already mentioned, pretty certain that the same failure of nervous

influence exists with regard to the lungs as to the other vital organs.

The action of the heart and lungs is in both cases diminished by this loss of nervous energy; but, in as far as regards the pathology of general congestion, there can be no doubt but that it is rather an immediate consequence of the first symptoms, as previously detailed, than of failure in the heart's action; for the capillaries having changed their functions at the secreting surfaces, and no longer performing their functions on the periphery, the veins remain comparatively without any circulation, and the action of the heart becomes not only languid, but partial—as occurred in all the cases where I performed immediate auscultation. The action of the right ventricle depends upon the influx and propulsion of blood from the right auricle, and its motions are necessarily stopped when that stimulus is wanting. The pulmonary artery presents the same features of congestion; and it is natural to suppose that this is not owing to failure of nervous influence, but to the causes now alluded to. The left side of the heart, continuing its pulsations with the ordinary activity, give, when the pulse is at all perceptible, the curious sensation of two

pulsations occurring at distant intervals. I may further remark, that in all the examinations I have seen detailed of persons dying from *Asphyxia pestilenta*, and in all I have myself witnessed, the right ventricle has been filled with dark viscid blood, entangled in the columnæ carniæ, presenting the appearance of a considerable polypus.

It is natural that, under these circumstances, respiration and the voice should become affected. The former is slow, abrupt, and laborious ; the want of animal heat causes the breath to be cold ; and insufficient quantity of blood affords a small blast of expired air. The voice is low, dull—sometimes moaning ; sometimes it is a short whine, difficult to be heard—a few words are only spoken at a time, from the incomplete respiration : but there is never any pectoriloquism ; on the contrary, nothing can be discerned by the naked ear placed in the most favourable situations.

The patient cannot exist long with these symptoms, so immediately destructive of life. Exertion is irksome, and the great wish is to be allowed to remain quiet. There is apparent coma—it is not so : the brain at this moment retains its functions. There are sometimes

accessory symptoms, as hiccough, spasms, &c. which render death more painful; but if not, the patient remains in a state of simple *Asphyxia*, and Bichât's order or succession of deaths is reversed.

The same morbid influence which thus destroyed the great function of circulation, affects, in a similar manner, all the secretory, assimilatory, and glandular structures in the human body. The eye, we have previously remarked, sheds no tears, the mouth is dry, and dissection has in every case shewn a preternatural dryness of the mucous and serous membranes. The liver no longer secretes its bile, which is retained in the gall-bladder; and the kidneys do not afford any urine. That this is connected with failure of nervous influence, is at once demonstrated by the symptoms and by dissection. There is no inflammation of the liver or kidneys: there is sometimes pain in the latter, but this is at a very early stage of the disease, and very momentary. In those cases where I have witnessed this symptom, it was always connected with a violent coexistent pain in the region of the præcordia. Examination has also shewn that there is no organic change in these structures, and no obliteration of the

ducts communicating with the secreting surfaces; and we can therefore only account for these symptoms by acknowledging a temporary loss of vitality, by an influence which must be communicated through the medium that regulates these functions.

There still remain a few facts in the physiology of the disease to be remarked upon, more especially as connected with the observations made by others. In the first place, I think that it results from the arguments adduced by various writers, that the ganglionic system of nerves is that which is primarily affected. And I am further inclined to think, from the manner in which the symptoms succeed one another, from the violent pain often experienced at the first moment of attack in the region of the præcordia, from the constriction existing in that region, the immediate accession of nephritic pains, and the absence of oppression or languor in the heart or lungs, that though the disease may be introduced by the lungs, yet the seat of its central action is in the solar plexus, immediately extending its influence to the other ganglionic plexuses of the abdominal viscera, and only subsequently to the plexuses of the par vagum;—but that we

must not seek for the influence of loss of nervous power in the lungs, for the reason of all the symptoms connected with the circulatory system.

Dr. Wilson Phillip says the air-cells and tubes of the lungs, it is found, by direct experiment, become clogged with phlegm, in consequence of which the air can no longer effect the necessary change on the blood ; so that it remains of the dark venous character, its colour gradually deepening in proportion as the office of the lungs fails. It thus becomes incapable of evolving heat, even were the due nervous influence supplied. This is very just with regard to the after-symptoms of the disease, but the coldness is entirely superficial at the commencement. The capillaries are then only affected ; there is no longer an evolution of free caloric from the arterial system, and the perspiration is cold and viscid ; and it is only in the second period of the disease that the function of the lungs becomes impeded, and the expired air is cold. The stomach, bowels, and skin, appear in all cases to be the first influenced by the disease, that is to say, the nervous and circulatory systems at their extremities, as the heart and arterial system, appear also to be affected before the lungs.

Dr. Copland has likewise stated that the retchings and evacuations, so generally observed, seem to answer wise purposes in the economy, inasmuch as they tend, by their influence on the circulation, to bring about a natural restoration of the vital actions, and to throw off the injurious load by which the springs of life are oppressed. "They are," he says, "efforts of nature to expel what is injurious, or to rally what is sinking." The adoption of any such opinion would lead to a very dangerous line of practice. The statement is not borne out by the physiology of the disease, and more especially by the nature of the evacuations, as chemical researches have made us acquainted with them. Nor, indeed, would it otherwise be any way consistent with the acknowledged principles of pathology, to suppose that the evacuation of such a quantity of supposed humours was necessary for the return of the healthy action of the secreting surfaces or organs. In mild cases, diarrhoea must evidently be a most malignant symptom; nor can I conceive, that even in very severe cases, where Dr. Barry thinks it may be a favourable symptom, that it can do otherwise than increase the congestion. I mean very severe

cases of collapse; for in such cases as are alluded to by Dr. W. Phillip, where there is total loss of nervous influence, any thing that is not death may be considered as a favourable prognosis.

I subjoin the following case—in which the body was opened by my excellent and valued friend, Dr. Macfarlane, of Perth—as much in illustration of the general character of the disease, as of the pathological appearances; and I think, from the opportunities I have had of instituting comparisons, more especially with those which have already been laid before the public, that it will be found instructive in both points.

SUSANNAH CLARKE, æt. 18, a girl of healthy appearance, was taken ill on Monday, the 5th of December, at five o'clock in the evening. She complained of great uneasiness in her bowels, her countenance changed rapidly in expression, her look being full of anxiety and terror. She was soon afterwards attacked with vomiting and purging of a reported bilious matter, followed by cramps. Mr. Grecian, surgeon, saw her at six o'clock, when he bled her, not obtaining more than four ounces: the blood was black and tarry. A mixture was administered in successive doses, composed of tinct. opii 5*ij*. tinct. capsic. 5*j*. liq. ammon. 5*j*. mist. camphor. 3*xj*. This succeeded in checking the vomiting. On Tucsday morning, Dec. 6th, her pulse felt free,

and her skin was hot: there was some pain in the head. Wednesday 7th, at 10 A. M. was again seized with vomiting, purging, and cramps in the legs. At 2 P. M. she was seen by Dr. Macfarlane. The appearances were then very characteristic of *Asphyxia pestilenta*: eyes sunk and glassy, and surrounded by a dark areola; face and lips blue; countenance expressive of much anxiety; hands cold and damp; nails livid; pulse not perceptible at the wrist; heart's action very feeble; tongue cold, and quite dry; breath cold; respiration easy; voice very low, and speaks in a whisper; complains of pain in the head. Six o'clock, P. M., appearance still rapidly changing for the worse. She had continued perfectly sensible till half-past four, but had now fallen into a state of deep insensibility; her arms presented a strikingly livid or dark blue appearance. She died at 8 o'clock the same evening. The treatment consisted of brandy and other stimulants, of hot applications to the body, and dry frictions.

*Sectio cadaveris*, 12 o'clock, 7th December.

The body presented externally the appearance of a person cut off by a very rapid death or sudden disease. Her person was comely, full, and robust, and bore no marks of previous illness; the eyes were not much collapsed, but were surrounded by a dark areola; the cheeks were plump, lips livid; expression of great placidity, and of no suffering; the hands, arms, breast, body, and inferior extremities, all robust and full, as belonging to a person in perfect health.

On laying open the thorax and abdomen, no morbid appearances presented themselves in the cavity of the chest. The pericardium was of its natural colour, and contained the usual quantity of fluid in its cavity; the heart was small, but perfectly natural and healthy; the left ventricle was small, and its walls felt to the touch and seemed as if they were in

a state of contraction ; the aorta contained no blood ; the right ventricle was in size proportional to the left, and was filled with a dark, viscid, fluid blood, which was entangled in the *columnæ carniæ*, and gave the appearance of the presence of a large polypus. The pulmonary artery and its valves were healthy in their structure, and it was full of dark fluid blood, as were also all the large veins at the inferior part of the neck and superior part of the thorax ; and all of them, when divided, poured out a vast quantity of dark, tarry, and viscid blood. The lungs were perfectly natural ; there was no *engorgement* in their inferior or superior portions. The right lung had formed extensive adhesions to the side of its cavity ; the pleura pulmonalis and the pleura costalis were also adhering throughout their whole extent, and it required considerable force to effect their separation. Beyond this there were no diseased appearances in the contents of the thorax.

On laying open the abdomen, as in the thoracic cavity there was observed a total deficiency of all secretions. The peritoneal surface of the intestines and the abdominal muscles were quite dry, and felt gritty to the fingers. The intestines appeared slightly injected with blood ; the liver, spleen, and kidneys, were of their natural size, and perfectly healthy. The gall-bladder was full of bile ; the stomach appeared inflated with air, and on cutting into it there was observed a partial red appearance scattered over the internal surface in patches ; the texture of the mucous coat was soft, and covered with a viscid, glairy fluid, which yielded to the nail when carried along the surface of the stomach. Near the pylorus there were several well-marked and elevated rugæ, radiating from a central point, and, after a short course, losing themselves on the surface of the stomach. There was

a small portion of a thin fluid floating in the stomach, which before being opened was much inflated with air. On opening a portion of the small intestines from the ileo-cæcal valve, a considerable way up, they were found to contain a highly viscid fluid, with flocculi held in suspension. On the surface of the intestines the flocculi, more indistinct, formed a viscid coat, which could be separated from the mucous membrane by the nail. There were no marks of inflammation in the latter. The ileo-cæcal valve was healthy and perfect. In the duodenum there were no marks of biliary secretion; it contained the same fluid as the remainder of the small guts, but it was not of so viscid a nature. The large intestines were healthy, and contained the same matter, only very fluid. This product of morbid action was found all along the ileum, more especially at its junction with the caput cæcum, as if laid on with a brush. The pancreas, uterus, and ovaries, were healthy, and of the usual size; the vesica urinaria was flattened and laid up, much contracted, close to the pubes, so as to be scarcely perceptible when looked for, in the cavity of the pelvis. The internal surface exhibited no marks of inflammation.

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The human body consists of organs of support and locomotion, which give form to the frame; of organs of circulation, secretion, and assimilation, by which life is sustained and decay repaired; of generation, by which the species is continued; and of perception and thought, by which the individual is brought in contact with the external world. These functions of

the human body are regulated by two great systems of nerves — the brain and spinal marrow on the one hand, and the ganglionic system on the other, of which the solar plexus is the centre. Though not mutual in their operations, these are brought into the closest connexion in the beautiful harmony of reciprocal actions and intimate relations, which we see in distant parts, and which we call sympathy. The respiratory system forms the link between the perfection of the one and the degradation of the other, and is, consequently, more immediately under the influence of the mind. Sensation without perception is, however, the characteristic both of the ganglionic and of the respiratory systems. In all the modes of death hitherto known, except where the powers of life are instantly extinguished, the functions of relation have been the first which cease. In this new and malignant pestilence, the functions of the organic or vegetative life are first affected, and it terminates with the sensiferous system, as in instantaneous death; the latter only ceasing in consequence of the total failure of the functions of the ganglionic system. The organic system of nerves is the first affected; the nutritive

functions and circulatory system, immediately dependent upon this class of nerves, are attacked by the morbid influence which is thence communicated to the respiratory; and the mental functions remain clear and unaffected to the last. It may truly be said, in contemplating the number and the variety of organs affected in this disease, the severity and intensity of the morbid influence, and the importance of the functions implicated, that it is impossible to conceive a more powerful concurrence of causes, tending to destroy all the vital powers of the constitution, than what is to be observed in extreme cases of this pestilence;—so remarkable in its history, so curious in a physiological point of view, and so eminently fatal to mankind.

ON THE MEASURES TAKEN FOR THE CURE  
OF THE DISEASE.

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I. TREATMENT.

THE treatment of all disorders is either symptomatic or empirical. The first implies a necessary acquaintance with the physiology and pathology of the disease, and of the action of various remedies on the human body: the second is expressive at once of the unknown action of certain therapeutical substances upon the human frame, and of their specific effects on disease. In the first case we alleviate, in the second we conquer, the malady. In the one we cure by combating the morbid changes; in the other we apparently destroy the poison. This is not at all satisfactorily proved; but it is a principle very generally acted upon. Thus, in the *Asphyxia pestilenta*, fortuitous circumstances, or experiment, may one day lead to the discovery of an agent that can overcome the destructive effects of an

infectious poison ; or, when science has given a more tangible form to doctrines of animate or inanimate contagion, or of epidemic influence, such a discovery may be the result of inductive research : but this will not be accomplished without throwing light upon many other fatal disorders. The *Asphyxia* appears to be a disease capable of adding to our knowledge of physiology. Why should it not also be the means of improving our acquaintance with the nature and laws of the propagation of disease ? The indications in *Asphyxia* are different in the three different periods of the disease :—in the first, the object is to avoid congestion, to restore the natural functions of the alimentary canal, and to induce mild reaction ;—in the second, it is to reproduce the lost secretions, to excite the vital functions, to restore circulation and animal heat, and to bring about a salutary reaction ;—and in the third, it is to allay the inflammatory action, and to induce a mild convalescence.

It is always of importance to arrest any diarrhoea that may precede the malady ; for this purpose astringents or opium, as pointed out by the Central Board of Health, will suffice : but if this diarrhoea is a mild form of the dis-

ease, to be recognised by symptoms previously pointed out, it will be requisite to administer calomel in doses of three or four grains, combined with a quarter of a grain of opium, every three or four hours. Mr. Searle recommends this plan of treatment only after the exhibition of an emetic; and if there is depression, the patient must be put to bed, kept warm, and wine-whey, or other hot stimulants, must be given.

Emetics were not much used on the first attacks in Sunderland, and I had not a fair opportunity of judging of their efficiency. One day that I was assisting Dr. Hazlewood in some severe cases in the hospital, after the death of the first nurse, our attention was attracted by the sudden screams of a stout young woman, of about twenty-two years of age, who had been employed as an assistant, but who had already had a slight attack of the infection. She had thrown herself upon a bed, and complained of violent pain in the stomach, extending round the waist, with a sense of constriction, and communicating itself to the kidneys. Dr. H. bled her to the amount of about sixteen ounces. This brought on an ineffectual desire to vomit, which was immediately assisted by copious draughts of salt and water.

She threw up with much difficulty; and on examining the ejected substance, three pieces of meat, said to have been taken into the stomach the day before, were found in an undigested state. They were an inch broad and two inches and a half in length. The girl was sensible of immediate relief, and had not, to my knowledge, any bad symptoms afterwards.

Emetics are indicated as a direct means of recalling the blood to the surface; for such an object they should be mild; and there can be no doubt that salt or mustard, as recommended by Dr. Gibson, will be found best adapted for these purposes. Dr. Lindsey relates a mild case, which occurred at Sunderland, where the mustard emetic was exhibited with success, and two severe cases where the pulse was restored by its action. Mr. Melin also relates, in the *Medical Gazette* for Jan. 7, 1832, p. 523, that when called in to the assistance of persons just attacked with the disease, in whom he found vomiting, purging, and slight cramps of the toes, he immediately mixed up a saturated solution of common salt and administered it, to produce a full emetic effect, recommending them to drink freely of warm water. In all of these cases they required no further assistance, and were convalescent the next day.

The exhibition of emetics is particularly indicated where there is any probability of a surcharged stomach, or of the existence of undigested matters in that organ, from the habits of the patients, or from the evidence of the symptoms. Mr. Searle goes so far as to say, that it is always advisable to commence the treatment by evacuating the stomach, whether the patient has vomited before or not, as it has often been found after death, when such measures have been omitted, to contain a large quantity of undigested vegetables and other substances which had been taken some days previously. I certainly cannot bring myself to advocate the indiscriminate use of emetics. In one case, where the pulse had fallen very much, I saw incipient apoplexy induced by the action of violent vomiting; and it often appears to effect that determination of blood to the head, which renders inflammation of the brain and spinal marrow more liable in the consecutive period of the disease. Emetics may be exhibited beneficially, then, when the stomach is loaded, or supposed to be so; when the secretion of the fluid characteristic of the pestilence is more abundant in the stomach, and vomiting is in consequence more frequent than purging, or when vomiting exists alone; and,

lastly, full vomiting may be indicated to restore the peripheral circulation.

There is a method of reasoning which, of late, has become almost annoyingly commonplace on the subject of *Asphyxia*, by which every individual remedy acting upon any one system of organs, is objected to,—as oxygen to the lungs, warmth to the surface, &c., because we do not restore the great nervous influence which is destroyed by the poison of the disease. I shall remark upon this when I come to the period of collapse. But certainly this mode of reasoning is very applicable, in another point of view, to this latter mode of action of emetics, where we may inquire if the amount of benefit rendered is equal to the evil effects of the remedy: and I doubt few reflective physicians will be led to induce full vomiting for the sole purpose of promoting circulation on the surface, more especially when that is of such a temporary advantage. There can be no doubt that, in a disease where we know of no remedies which strike at the root of the evil, we act well in directing a multiplicity of means towards separate functions, in order to attain one and the same end; but when their action is thus looked

upon in its true light, it will also be seen how important it is, not to diminish too far the vitality of one system of organs, to obtain a salutary effect upon another.

The exhibition of calomel in the early stages of the disease is of the utmost importance. The existence of diarrhoea under suspicious circumstances is now never neglected in situations where the *Asphyxia* exists; and in Sunderland it was generally found that the premonitory symptoms were readily removed by the administration of this useful remedy. In the house of Dorothea Purvis, after her death and that of her grand-daughter, another of the family, a stout girl about nineteen years old, sent to Mr. Torbock's on account of a slight illness. I went to see her in Mr. T.'s absence, and found her labouring under a mild diarrhoea, accompanied by giddiness and much agitation. She trembled a good deal when I felt her pulse, which was full, though at the time she was still excited. Thinking this might be a case of "*pseudo-Cholera*," I ordered her a bolus of calomel and jalap, which induced abundant stools of black, tarry fæces. The diarrhoea discontinued, and she got well immediately.

Mr. Melin, a distinguished military surgeon,

Mr. Torbock, and myself, visited a house in Burley Street where three children were affected with diarrhoea at the same time, and only one had symptoms of *Asphyxia*. I have seen cases in which this morbid action has been removed by laudanum, and others where the chalk mixtures have proved equally efficacious. Dr. Becker says, that in the hospital at Berlin, No. 1, out of from 70 to 80 attendants, 35 of them had diarrhoea, sometimes accompanied by vomiting, &c., and 11 had *Asphyxia*.

The exhibition of calomel has been called, on the continent, the Anglo-Indian practice, and has been much deprecated; but I doubt because it was not a specific, and not because it was not a useful remedy. The *modus operandi* of calomel in *Asphyxia* can hardly be well ascertained: its influence on the biliary secretion is of minor importance, and only of immediate utility in the consecutive period; but its influence on the secretory surfaces of the intestines, in correcting that action which converts the blood into serum and insoluble white flocculi, is well marked, and consequently its utility indicated in the most decisive manner. Mr. Annesley gives calomel

in scruple-doses several times daily, with the intention of ridding the intestinal mucous membrane of the creamy matter with which it is usually invested.\* Dr. Jamieson uses calomel to combat the spasms of the intestines. Calomel can now, from very extensive trial, only be considered as an assistant remedy, and not as a medicine in which any thing like the total reliance placed upon it by many Indian practitioners, can be persevered in with justice to the patient.

Bleeding is indicated not by inflammatory action, but to diminish the congestion more especially in the capillary vessels of the internal organs, which it does by lessening the volume of the blood, rendering the venous and glandular systems less liable to be gorged, and giving to the lungs and heart a greater capability of continuing their functions. It is also indicated to diminish the severity of the febrile reaction ; and it appears to act empirically in alleviating the morbid influence of the shock given to the nervous and vascular systems by the pestilence.

The utility of blood-letting was the subject

\* See Lancet, No. 429, p. 278.

of much discussion among the medical men of Sunderland ; and one gentleman always expressed himself, and that in very strong terms, as decidedly opposed to it. It was, however, I believe, with that exception, a part of the practice of every medical man of the town, and all appeared convinced of its utility to a certain extent. Dr. Lefevre mentions that the use of the lancet was recommended by the Russian government in the first stages of the disease ; but that the order was countermanded, because in many cases the blood would not flow ! Dr. Young\* also objects to blood-letting, because it is frequently impracticable. Such objections bear absurdity on the very face of them ; they do not prove the inefficacy of the remedy, but the incapability of putting it in practice in advanced stages of the disease, and the consequent necessity of having recourse to it as soon as possible. The great characteristic of *Asphyxia pestilenta* is the determination of the blood from the peripheral surface to the central organs, thereby producing an inequality in the circulation. Oppression, says Mr. Searle, which

\* Remarks on the Cholera Morbus, &c.

depends upon venous engorgement, will be immediately relieved by blood-letting; in nine cases out of ten, Mr. Annesley remarks, if bleeding can be accomplished in the early stages of the disease it will prove successful: and I can only state, that in all the cases I saw in Sunderland, when a large and copious blood-letting was obtained, the termination was favourable. This was more particularly remarkable in William Thompson's case. Dr. Daun recommended in the hospital practice extensive blood-letting; and this advice was followed with the greatest success whenever it fell to the lot of that institution to have patients sent in who were not already past recovery.

In the generality of cases blood-letting is efficacious in proportion to the earliness of its employment. In the first stage, while the pulse is yet full and the temperature not reduced, it may be plentiful, as there are chances of its cutting short the disease. The pulse may be the guide here; if oppressed, bleed till it becomes softer and fuller. But when the collapse has come on, the quantity drawn should be small. Eight ounces in an adult will be sufficient to allow the remainder to circulate more freely and relieve the heart,

and at the same time will not exhaust the patient too much. The absence of the pulse is no prohibition of the use of the lancet. In all cases care should be taken to avoid syncope ; and in persons addicted to spirituous liquors, bleeding, though beneficial, often increases the violence of the spasms in the muscles of the extremities and the trunk. Dr. Keir, whose opinions,—if I may judge from the able report published in “Papers relative to Cholera Spasmodica”—are deserving of the greatest attention, mentions that blood-letting, when the vital energies are very much depressed, has proved hurtful. There can be no doubt but that in cases of extreme old age and debility, the amount of blood drawn must be very small to do it with safety ; and it is probable, that in cases where a sudden and very large evacuation is the first symptom of the disease, immediate bleeding will be pernicious. But with these exceptions, the experience obtained from what I saw of the general practice at Sunderland, combined with the light which pathology has thrown upon the nature of the disease, lead me to think that blood-letting should always be had recourse to in the first and second periods of the disease, while there is any chance of obtaining blood.

We must follow up the above plan of treatment by an immediate attention to the prostration of strength and other symptoms which accompany the progress of the disorder. Hot negus or wine-whey may be given to young persons, or brandy to the adult, whenever the stomach can bear it. If liquids are not retained, it will be necessary to exhibit stimuli in the dry form. Dr. Ogden had a pill made for this purpose, which was found very serviceable. It consisted of  $2\frac{1}{2}$  grains of capsicum, 1 grain of calomel, and  $\frac{1}{2}$  grain of opium. Dr. Copland also gives a recipe for what I am inclined to think would be a useful pill to promote healthy perspiration.

R: Pulv. ipecacuanhæ comp. gr. iv.

Camphoræ rasæ, gr. iiij.

Syrup. papaveris, q. s. M.

Fiant pilulæ jj., quartâ quâque horâ sumendæ.

Measures must at the same time be taken to restore animal heat; and the simplest methods are the most efficacious. Much has been said about hot bags of sand, &c., and frictions with various hot stimulating substances. The bags are thrown aside by the cramps, or found quite ineffectual; the bottles of hot water are every

now and then on the assistants' feet; and the preparation of frictions withdraws attention from more important symptoms. Latterly, in the hospital, the whole plan consisted in placing the patient before a large fire, and momentarily renewing very hot blankets. This is the best mode of proceeding, and the patient can then be watched carefully and without distraction. Hot-air baths, or vapour baths, may be of use at this juncture; they certainly are of none in the period of collapse.

The carbonates of soda and ammonia have been found of the greatest utility in this period of the disease. Mr. Goss says\* he was sent for, in India, to an old native woman who was labouring under all the symptoms of the second stage of the disease. He administered about a drachm of the soda with ten or fifteen grains of the carbonate of ammonia: the stomach ejected three or four doses, which were repeated as often as the organ became tranquil enough to admit of its being swallowed; ultimately one dose was retained, and half the quantity was given every hour, until all bad symptoms had disappeared; and the patient recovered without the aid of

\* Practical Remarks on the Disease called Cholera.

any other medicine, excepting a dose or two of calomel and jalap. Mr. Goss was taken ill himself; and during his confinement four or five (why so indefinite?) cases were treated under his instructions by a native assistant, all of which terminated favourably.

Without any knowledge of these facts, Mr. Torbock was led to make trial of the carbonate of soda at Sunderland, and met with the most successful results. One case which I attended with him, the patient, a boy of about eight years of age, had scruple doses administered to him every half hour, and at the lapse of that period exhibited the greatest anxiety lest they should be omitted. The action reminded me of the effects of the carbonates of soda and ammonia on the bite of a snake or the sting of a wasp.

The diffusible stimuli most generally in use at Sunderland were, oil of turpentine, the aromatic spirits of ammonia, the essential oils, brandy, and ether. Most of the cases contained in my list were treated in this manner, and had a fatal result. Hot applications, mustard poultices, and blisters, when indicated, were never neglected. Turpentine I saw in two cases afford considerable relief, when administered as an injection; but the ammonia

little or none. In one case I had an opportunity of trying the liquor ammoniæ, but without success. It would perhaps be more instructive if I could detail cases on this important subject, but my space will not allow me; and I must therefore content myself with mentioning the results.

I have premised, that in the *Asphyxia pestilenta* we have a number of symptoms which are always pretty definite in their succession, and present so many indications for the plan of treatment. Remedies applied to any one of these separately have no beneficial influence; but when all of them are simultaneously combated, we have every chance of effectually triumphing over this fierce disease. Thus, it has been remarked to me in the Sunderland hospital, when using the hot-air bath, that we might as well try to heat a leg of mutton as a patient in the stage of collapse; and a similar objection has been urged against oxygen. I was at first very doubtful if this gaseous substance could be adopted with good effects. It was objected that, upon physiological principles, if you do not increase the quantity of blood passing into the lungs, it is more than useless to throw in an additional quantity of oxygen besides what is

contained in the atmospherical air; as it has since been objected by Mr. Kennedy, that, while you do not increase the nervous influence, and thus remove the venous remora, no advantages can be expected from exhibition of the gas. Now it appears that, independently of the influence of the nervous system upon the vital functions, each system of organs has an organic stimulus of its own, which consists in the exercise of its functions. Thus the stomach is roused by the introduction of food, and the power of the cerebral functions increased by thought; and upon this principle we should expect the lungs to be roused to increased action by a plentiful supply of their natural stimulus. I conversed on this subject with my friend Dr. Holland, of Sheffield, and I believe that his opinion coincides with my own.

Dr. A. Hunter, of Edinburgh, transmitted to the Medical Commission of Sunderland an apparatus for placing the patient in an atmosphere of oxygen; but at the time it came there were few cases, and I do not know if it has since been put to the test of experiment. This apparatus was accompanied by another to exhibit the same gas by injection. Mr. Hulse and myself tried the efficacy of this remedy,

and we found the pulse rise immediately upon its exhibition: its influence upon the nervous system was more marked than when introduced by the lungs; and in the case where we tried it, an aged man in the period of collapse, he at the first moment declared himself quite well, soon afterwards made some incoherent remarks, and became slightly moribund.\* These effects were very temporary; but I cannot coincide with those who assert that the degree of collapse is greater after the exhibition of oxygen than before. Mr. Torbock had, previous to my arrival, used oxygen, in combination with other means, successfully in one or two cases. It

\* Some objections were made to this experiment, on account of the patient being then under a course of sulphate of quinine, according to instructions given by M. Majendie; but he had now for three hours taken six grains of that febrifuge every half hour, without the slightest alleviation of symptoms; and the exhibition of an injection of oxygen could surely no longer interfere with the results to be obtained by quinine: if, indeed, humanity for the patient did not demand at that period the adoption of other means. M. Majendie also objected to the use of oxygen whose purity had not been well ascertained. We could only subject it to the common test, which is one of very great value. Dr. Hazlewood has since tried the nitrous oxide; but I do not know with what success.

was employed in W. Bulman's case, but that was one of peculiar severity : and it was tried with success in the case of the pilot Elliott, who unfortunately perished afterwards, in the consecutive fever, having been very much neglected.

The other symptoms that must be relieved at the same time, are more particularly the violent pains which often exist in the region of the præcordia, and the spasmodic action which shews itself in the extremities, extending sometimes to the trunk. This must be done by means of frictions and counter-irritants externally, and the exhibition of antispasmodics and sedatives internally.

For the purposes of friction, I have stated that hot dry blankets are preferable ; but in extreme cases, advantage may be obtained from the use of warm spirits ; and as counter-irritants, mustard poultices—which are made by simply spreading thick mustard upon a piece of linen, and laying that over the feet or stomach—have been found sufficiently efficacious. When sinapisms produce no irritation, the blistering fly will also be found inert, and liquid epispastics must be had recourse to ;—the pyroligneous acid, with cantharides, or the ointment of the tartrate of antimony, will answer these pur-

poses. Flannels wrung dry out of very hot water, and soaked in warm oil of turpentine, have been recommended as an immediate application to the stomach and abdomen. The use of the actual cautery along the sides of the spine, as practised by Dr. Lange, of Cronstadt, and advocated by Dr. Barry, appears to be received with great caution in this country.

The same sedatives and stimulants which I have noticed as used in the first period of the disease, were continued in the stage of collapse, but without the slightest benefit. Large warm enemas, with laudanum, were sometimes exhibited. The cajeput oil was tried very extensively in the hospital practice. In one case the evacuation of intestinal worms produced a favourable crisis, and led to ultimate recovery : but of all the cases of which I have preserved notes, although they had all the care and attention which could be expected from the medical gentlemen, and the same plan of treatment being systematically pursued, how few recovered from the disease! It is quite evident, then, that another line of practice must be adopted, and this should be the use of cold affusions ; a practice much in vogue in the East, and since introduced into the Cholera hospitals of the continent with marked success.

One of the physicians of the Cholera hospital at Berlin, in writing upon this subject, says, “ In those living corpses which are struck with asphyxia, lying cold and without any pulse, external and internal stimuli cease to be so, inasmuch as the debilitated asphyxiated frame cannot in its turn act upon them: no steam apparatus, however vaunted, no warm bathing, no friction, no excitement, is sufficient in these cases.” And this is what I am sure every person who has seen the disease will coincide in. Though produced from internally outwards, and not externally acting inwards, *Asphyxia pestilenta* bears a strong relation to death by frost, in which there is an icy coldness of the surface, a want of pulse, and great congestion of the central parts. In these cases we use frictions of cold snow, &c. until a gradual warmth is restored ; and it is on the same principle that sudden cold affusions are indicated in Cholera. So forcibly did this strike medical men in this country as a neglected remedial measure, that when the *Berlin Cholera Gazette*, which contained the notice of its successful employment, was made known, every writer was anxious to shew that he had himself previously advocated its adoption.

The patient is placed in an empty and dry

bathing vessel or tub, and several buckets of cold water are poured on him, while the regions of the stomach and back are subjected to a kind of shampooing or friction; and this process must be repeated if the urgency of the circumstances requires it. No physic is given, and cold water is allowed for beverage. If the pulse revives, the affusions are continued in a tepid bath, and the patient is put to bed, where perspiration is excited by gentle frictions with cold flannels. It must be kept carefully in mind, that cold affusions are only applicable to the second period of the disease, and not to the first; and it is not a universal remedy, but can only be used in particular cases. To secure the convalescence of the patient, it is only necessary that he should be carefully watched, and all symptoms of returning heat and vitality, or recurrence of the usual secretions, be assisted by the exhibition of warm restoratives and gentle aperients, taking care to avoid local inflammation.

After these instructions, I need say little with regard to the treatment of the consecutive maladies, which are so various; but when the stage of reaction is attended by cerebral symptoms, it will be necessary to shave the head, apply cold

lotions, as also leeches, to the posterior parts of the head and temples, and to exhibit purgative medicines. Derivatives, as blisters and sinapisms, are also of the utmost importance. When the stage of reaction is accompanied with gastro-enteric affection, and disturbance of the functions of the liver, the application of leeches to the epigastrium, and of blisters to the abdomen, may be necessary. Emollient injections should be occasionally thrown up; and Dr. Copland remarks, that small doses of opium combined with camphor and the blue pill, or the hydrarg. c. cretâ, may also be given from time to time. When typhoid and nervous affections supervene, tonics and antispasmodics are indicated, and the patient will require the most incessant attention and care. The treatment which must be followed if the consecutive affection is attended with pulmonary symptoms, sub-inflammatory state of the liver, or dysentery, is founded upon the same local indications: topical bleeding and blistering, medicines which increase the secretions of the skin and the abdominal viscera, in the first; calomel, with aperient draughts, and warm diaphoretics, in the second; and emollient and diaphoretic medicines, and injections, in the last form of the consecutive disease.

To put this plan of treatment in a more forcible light, I have compared it with the tabular form of the symptoms of the disease, and the indications appear in every stage to be directly fulfilled. I subjoin the results, as a synopsis of a mode of treatment, to be varied in individual cases, but which, I am strongly inclined to think, will prove a serviceable frame-work.

It may seem that some of the symptoms hardly merit the importance which I have attached to them. They are, however, only the outward signs of momentous pathological changes; and it is on this account that I have noticed them as symptoms to be treated.

### *Plan of Treatment.*

*1st Period.  
OPPRESSION.*

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| <i>Diarrhoea.</i> Calomel and opium; chalk mixture.<br><i>Prostration.</i> Bleeding; salt or mustard emetics.<br><i>Evacuations.</i> Bolus of calomel; carbonates of soda or ammonia.<br><i>Cold surface.</i> Heat; frictions with hot dry blankets; vapour or hot-air bath.<br><i>Loss of colour.</i> Warm restoratives.<br><i>Febrile action.</i> Mild aperients; dia-phoretics. |
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<i>2d Period.</i> <b>COLLAPSE.</b>	Epigastric pains. Mustard poultices or liquid epispastics. Evacuations. Warm enemas; turpentine injections. Cramps. Sinapisms; frictions; sedatives. Absence of secretions. Aromatic spirits; volatile essential oils; calomel. Cold breath. Oxygen; nitrous oxide. Loss of sensation; heat, pulse, and voice, deficient.
<i>3d Period.</i> <b>FEBRILE ACTION.</b>	Mild. Tepid baths; gentle aperients. Severe. Local depletion; blistering; purgatives and diaphoretics.

The first grade of the disease is treated by bleeding, emetics, and calomel; the second by mild aperients; the third by cold affusions; the fourth by tepid baths and sudorifics; and the fifth by topical blood-lettings, blisters, and purgatives.

## II. PROPHYLACTIC MEASURES.

The means of preventing the progress of the disease, and of securing individuals from its attacks, consist simply in seclusion and avoiding predisposition. The first of these

can be put in execution by the government of a country, by local authorities, and by individual will: the second can only effectually be secured by personal exertion. I shall not make any observations on the necessity of quarantine, as I have already remarked upon the subject; but I think that the progress of the Indian pestilence in this country, as well as on the continent, mark it out as one of the most controllable diseases that ever assumed the character of a pestilence, both from the short time which apparently the virus can remain latent in the human system or active in apparel, and from the few, except the intemperate, who appear exposed to its morbid influence. And from these considerations, convinced, with others, of the impossibility of introducing any general system of seclusion into this kingdom, I cannot too much enforce the necessity of impeding, as far as is possible, the progress of vagrants across the country, and that more especially in the vicinity of the disease. In a letter to the editor of the *Medical Gazette*, Mr. Greenhow, of North Shields, says, "all the little towns and villages round about us are suffering under a great mortality, owing to the unrestricted admission of men-

dicants and vagrants." Dennis M'Gwin, who took the disease to North Shields, came from Sunderland. The first case in South Shields was a boy from Gateshead. A pedlar-woman took it to Houghton—a traveller to Morpeth; and I have no doubt its arrival could similarly be traced to Durham, Haddington, and Tranent; all towns upon the same high road. A wanderer also perished of the disease at Doncaster; but luckily there were no other cases.

The duty of all local boards of health, after securing their town from the inroads of those most predisposed to the attacks of the disease, most liable to have been in its vicinity, and most likely to be the bearers of its fatal germs, is to provide hospitals for the immediate reception of the afflicted. In all towns and in all countries it is difficult to get people to go to public institutions for the recovery of health; the middling classes will not go, and the poorer offer the greatest resistance to removal from their homes. Wherever a person has a room of his own, and proper precautions can be taken, it may be needless, as it may be impracticable, to effect this removal; but when, as so often occurs in populous towns, many

are crowded together in one apartment, I decidedly think that coercive measures should be had recourse to. It may be said, that it is no crime to be ill ; true : but the infected become involuntarily the means of doing much mischief, and must be treated accordingly. A person mentally affected is confined, because his aberration renders him unfit to partake of the advantages of the social compact, or even renders his freedom of action dangerous to society ; so a person unfortunately the victim of an infectious disease should be made to yield to the simultaneous suggestions of reason and of humanity. The importance of such measures is the more paramount in proportion to the paucity of cases ; as thus, under favourable circumstances, the disease may be suffocated in its poisonous bed.

It is also the duty of local boards of health to improve, as far as is in their power, the condition of the poorer classes in their districts. This object is of importance to the whole community ; for when a disease assumes a concentrated character, the chances of its dissemination increase, even under similar circumstances of predisposition or of situation. Where there is not a volcanic crater, whose waters can, as in

the “eternal city,” be made, at the price of their virtue,\* to mingle with the impurities of the town, the modern invention of fire-engines can be adapted to this purpose; and the subsequent removal of filth, and cleansing of narrow lanes, will afford employment, and be efficacious in keeping away disease from many aged paupers. Dirt must be removed before the arrival of a pestilential malady; for the disturbance of accumulated impurities is, under certain circumstances, as dangerous as their neglect. Coals and clothing may, with discrimination, be distributed among the poor; and, instead of brandy, or brandy and laudanum, care should be taken that medical assistance is in immediate readiness. This should not be left to chance; but certain medical gentlemen should be nominated by different towns to the care of districts, always of less extent as the population is poorer and more crowded. In Sunderland, one short street and an adjoining lane gave full employment to three medical men, while only one was appointed to its superintendence, and while a host of practitioners held sinecures in Bishop-Wearmouth, the St. Cloud of that town.

\* The virgin Juturna.

The relations in which every individual stands with regard to disease, independent of the vicinity of infection, are external and internal; the latter decidedly of the most importance; and a few precepts can be rapidly given, which should be retentively stored up. The external circumstances are, situation, air, temperature, and dress. When an infectious disease visits a house, whoever is not bound by the ties of humanity or relationship to give their care to the afflicted, should remove; and when those are dead or recovered who required their attentions, whenever in their power they should get away to the country for a short time. Could I have succeeded in making some poor people follow my advice on this subject in Sunderland, I could have saved several lives. Medical men should make themselves gradually acquainted with the disease; and if, in the course of their practice, they feel unnerved, they should relax for a time. The *air* should be renewed as often as possible, whatever is the situation of the individual. Free ventilation is as necessary to health as air itself is for the burning of a candle. The *temperature* is a matter of importance: high temperatures generate moisture, which, besides

that vapour must have a greater capability of retaining and transmitting noxious particles, is generally unwholesome to the human frame. Heat relaxes the solids ; and though the body should be kept warm, artificial means of producing that warmth should be as seldom resorted to as possible. Cold to a healthy person is always bracing, and hence the superiority of northern nations. It would be curious to see a vigorous sportsman, who does not resort to drams, attacked by the Cholera ! Great cold is hurtful, but that probably to a very slight degree, unless extreme, or combined with wet. *Dress* must always be attended to ; a flannel belt should be worn in the day-time round the waist, covering the pit of the stomach and part of the belly. It should be abandoned at night-time, on account of the debilitating effects of copious perspiration. It will be a great act of charity to furnish flannel petticoats to poor females, and provide blankets for children.

The internal relations of man or woman to disease are mental and bodily. We cannot provide against depression of spirits or grief ; but I could point out many cases where a cheerful devotion to a dangerous duty—where

the exercise of the higher feelings of benevolence and humanity—and where, in another class, the determined energy and activity of thought necessary to combat a malignant pestilence, have, by the influence of the mind on the body, more effectually shielded individuals from morbid influences, than the most cautious preparations to avoid their proximity or annihilate their poisonous action. Bodily and mental exertion are both useful,—they engage the mind, they invigorate the body, and engender health, bringing with them a light heart and gay disposition. Eating, at least the quantity, or mode, or nature, should never be thought about; the very consideration whether such and such a thing will disagree with us, breeds *malaise* and indigestion. Care should be taken not to load the stomach with crudities; but when should not that care be taken? I am now writing for people supposed to possess some judgment. I had no idea that some persons swallow, like carnivorous animals, pieces of meat two or three inches in length: I would therefore have all servants quietly recommended to chew their food. In reading books on Cholera, study the results, but do not peruse the cases from the mere interest

which they excite. The enervating influence of the passions —

*Quicquid agunt homines, votum, timor, ira, voluptas —*

must more especially be avoided. Let those whose energies are blunted by dissipation, be roused, by the arrival of a pestilence, to the sense of their own prostrate weakness and corrupted degradation. I need not say any thing about drunkenness, as none addicted to that vice have patience to obtain information by the slow process of reading. I am almost ashamed of humanity, when I think that this pestilence appears as a denunciation against the class of spirit-drinkers, affecting others only from its infectious characters ; but to one sober person nearly five intemperate are attacked ; and to one death of the former there will be ten of the latter. The quantity of vitality does not appear to bear any relation in individuals to bulk, to strength, or to constitution ; that is to say, to the resources against disease. Unpleasant comparisons between persons are not founded in nature : the young infant, exotic child, and sensitive female, are upon a par with themselves, and with the feeble, the studious, or the strong, as long as circumstances are the

same; but the chances of their recovery are different.

*Jamque exegi.* If I have been severe in some of my observations, my object cannot be mistaken. It is not to vilify any individuals or body of men. I have had nothing at heart but the welfare of my countrymen, and no other wish than that of diminishing the ravages of a fierce pestilence. Strange, that in a civilised country it should have found a harbour in the ignorance and unfeeling stupidity of a guilty few, whom it would be no cruelty to wish scourged from the earth! How gratifying it is, after viewing the disgusting scene exhibited at Sunderland on the first appearance of the disease, to see the manly and philosophic manner in which it is to be combated in the metropolis of the north—a more than Modern Athens! Part of the medical men of that city have formed themselves into a committee, with separate duties, which include observations on the treatment, the pathology, and the statistics of the malady; and nothing but advantages to science and to humanity can accrue from such a mode of proceeding.

I leave, in all humility, the little I have done, to be judged by impartial science and

an indulgent public; and on a subject like the relief of my fellow-creatures, nothing will afford me greater gratification, than that others may make my observations “the means, though not the end, of their study;” and that, in imitating me in a sound method of induction, they may surpass me in the light which they may throw upon a pestilence of such slow but certain progress,—of such various but marked symptoms,—and terminating so frequently in a painful and rapid dissolution.

THE END.

LONDON:

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